

Sunlight resets internal clock in people with sleeping problems, study finds

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USPA News - Being continuously exposed to natural sunlight for just one week resets internal biological clocks in humans who are suffering from sleeping problems, according to a study published on Thursday that may also explain an observed paradox in brain activity. The study, published in the journal 'Current Biology,' found that the circadian clocks of eight people were fully synchronized after they experienced a week of exposure to true dawn and dusk with only the glow of a campfire at night.

The synchronization occurred in all participants, regardless of whether they were early birds or night owls during their normal lives. "What's remarkable is how, when we're exposed to natural sunlight, our clocks perfectly become in synch in less than a week to the solar day," said Professor Kenneth Wright of the University of Colorado Boulder. "By increasing our exposure to sunlight and reducing our exposure to electrical lighting at night, we can turn our internal clock and sleep times back and likely make it easier to awaken and be alert in the morning." Electrical lighting, which became widely available in the 1930s, has affected our internal circadian clocks, which tell our bodies when to prepare for sleep and when to prepare for wakefulness. The ability to flip a switch and flood a room with light allows humans to be exposed to light much later into the night than would be possible naturally. Wright and his colleagues first studied the internal circadian timing of eight adults after one week of routine work, school, social activities, and self-selected sleeping schedules with the normal exposure to electrical lighting, which is much less intense than sunlight and is different in color from natural light that changes in shade throughout the day. After the first part of the study, the eight participants then went out camping at Eagles Nest Wilderness in Colorado, where they wore wrist monitors that recorded the intensity of light they were exposed to, the timing of that light, and their activity. No flashlights or smart phones were allowed, but participants were able to sleep at any time they chose. The study showed that a typical, modern environment causes about a two-hour delay in the circadian clock as indicated by fluctuations in the hormone melatonin, which the body uses to signal the onset of our biological nighttime. As a result, before the week of camping, the participants tended to stay up until after midnight and woke up around 8 a.m. in the morning. But after a week during which the participants were only being exposed to natural lightning, all measures of circadian timing shifted two hours back, and sleep schedules followed, even as the total time spent sleeping stayed about the same. The group, which included both people prone to either staying up late or getting up early, became in synch with sunset and sunrise. "When people are living in the modern world - living in these constructed environments - we have the opportunity to have a lot of differences among individuals," Wright explained. "Some people are morning types and others like to stay up later. What we found is that natural light-dark cycles provide a strong signal that reduces the differences that we see among people - night owls and early birds- dramatically." The findings may also explain an observed paradox in brain arousal. In our modern world, melatonin levels tend to decrease to daytime levels about two hours after we wake up, which means our biological night extends past our wake time and contributes to why many people feel at their sleepiest soon after waking up in the morning. But with the exposure to natural light, this decrease in melatonin shifts to the last hour of sleep time, allowing brain arousal to occur earlier and helping people to feel more alert in the morning. The new study results could offer some valuable solutions for people who are struggling with their sleeping patterns, the researchers said. To combat a person's genetic drift toward later nights, exposure to more sunlight in the morning and midday could help nudge his or her internal clock earlier, Wright said. Dimming electrical lights at night, including TVs, laptops and other personal electronic devices, may also help internal circadian clocks stay more closely attuned with the solar day.

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