Sleep, health, and the changing of the clock

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The nation has spoken. With the Sunshine Protection Act passing unanimously through the U.S. Senate and now making its way to the House, it's clear that the United States of America does not believe that changing clocks twice a year benefits us as a nation.

The science has spoken. There are more heart attacks and car accidents after "springing forward" and injuries on the job in this time period

require more recovery time.

Given these factors, should we set the clocks to Daylight Saving Time and be done with it as the U.S. Senate is proposing?

Not so fast, says David Wagner, Doug McKay Research Scholar and associate professor of management at the Lundquist College of Business.

Wagner is the coauthor of "Work and Sleep: Research Insights for the Workplace," and his research has been published in the *Academy of Management Journal*, *Journal of Applied Psychology*, and the *Journal of Sleep Research*, among others, and has appeared in popular outlets including the Harvard Business Review, The Wall Street Journal, and Marketplace.

His research shows that losing an hour in the spring results not only in lost productivity that Monday, but even impacts moral decision making, with police officers meting out harsher punishments than other days. Additionally, on-the-job injuries increase on that day by 6 percent. And those injuries tend to be severe, translating into a nearly 67 percent increase in lost workdays.

While losing an hour of sleep does appear to be the source of a many of these impacts, choosing the best hour to go with permanently should be a thoughtful process.

Daylight Saving Time allows folks additional evening daylight hours for outdoor exercise and park use, and it also allows businesses to take advantage of bright daylight after 5:00 p.m., encouraging consumers to shop after work. Evening traffic accidents may be reduced with increased light.

One of the loudest arguments against permanent Daylight Saving Time is

that it results in our bodies' biological clocks fighting against the natural cue of the sun. In the winter, many locales will have darkness long into the morning, meaning that people will be waking earlier than their body would naturally. The implication is that people will be arriving at work before their peak alertness. Moreover, adolescent children (think middle- and high-schoolers) learn and perform best later in the day than younger children and adults. Beyond these practical considerations, fighting against our natural rhythms by going to sleep too late or getting up too early also has serious health implications including heart events, metabolic issues, and even cancer.

Moreover, in winter, Daylight Saving Time results in children walking to school with less light and visibility in the mornings and adults commuting to work in the dark, making accidents more likely.

Naturally, human bodies respond best to waking in light and sleeping in darkness. Standard Time is based off of a single prime meridian, which for nearly 100 years was positioned at the Royal Observatory in Greenwich and now is a more accurate, though nearby position set by the International Earth Rotation and Reference Systems Service.

So how did we get here? Smart people have been looking for a way to maximize daylight for centuries. Some credit Ben Franklin with "inventing" Daylight Saving Time, though that seems to come from misunderstanding what many consider to be a satirical article positing the French could save money on lamp and candle lighting costs by moving their clocks back in order to get out of bed earlier. Seems reasonable enough, until he smugly suggests waking his sleep-loving (i.e. "lazy") neighbors with cannon blasts. Though other thinkers put similar ideas forward, the concept of changing all clocks in a geographical area for the greater good wasn't widely adopted until the first World War as an austerity measure, with Standard Time returning post-war. The cycle repeated during World War II. In the U.S., a 1966 act of Congress put

spring and fall DST start and end times in place. The start date was moved up slightly by President Ronald Reagan in 1986, and extended again by President George Bush in 2005. U.S. territories, as well as the states Hawaii and Arizona, do not participate in DST.

But if one of the aims of daylight saving in modern times is to reduce energy consumption, as proponents often cite, it isn't working. In their 2008 study, researchers Matthew Kotchen and Laura Grant found the opposite is true: overall energy demand increases by approximately 1 percent during DST.

There are pros and cons to both standard and daylight saving times, it's the switching back and forth that is literally killing us, Wagner said.

"In the end, getting a healthy amount and quality of sleep curbs most concerns," Wagner said. "However, getting that sleep may require the adjustment of social institutions, such as high school and workplace start times. Good sleep hygiene tends to improve work, productivity, and physical well-being, so we humans should prioritize consistent sleep patterns rather than focusing on the hour on the clock."

In the continental United States, is it realistic to expect that we are going to shift school and work start times, the scheduling of social and sporting events, and other activities, or would it be better to shift to standard time as a way to align our biological clocks with the sun?

"Given congress is stepping up to make this change, we would do well to consider ending the shift, but settling on standard time," Wagner said. "Though I really like those summer evening bike rides, the overall health and safety implications of permanent Daylight Saving Time are too great to ignore."

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