



Daylight saving time is bad for your health

We should go to year-round standard time, as the sun intended



Anisha Kalidindi
Molecular Biology
Ohio State University

November 2, 2019

Why do we have daylight saving time (DST), when it seems like it is constantly the butt of jokes? Why do we even have it if it appears to be bad for our health?

It's an old joke. One idea for DST was presented in 1784 by Benjamin Franklin in a satirical essay in the *Journal de Paris* as a way to save on candle wax. It was first implemented in Europe and the US during World War I. The implementation of DST has, across the last hundred years, been supported by purported reductions in energy usage and increases in daily productivity. While in the US it has taken a few different forms, in 1966 the Uniform Time Act cemented the current schedule of six months of standard time and six months of DST.

Other arguments in favor of DST are that it allows people more time to enjoy leisure activities during the summer months and that it leads to an increase in physical activity — but all of these remain controversial. A 2014 study did not find any difference in activity patterns between people living in Colorado, Utah, and New Mexico and residents of Arizona, a state which does not observe DST. Studies on energy usage have also had mixed results: one showed moderate savings in energy spending in Norway and Sweden, while another showed an increase in energy spending in Indiana. However, these results are hard to tease apart from natural energy savings that occur in months where people spend more time outside, regardless of DST.

Work and play are one thing, but it also matters that our bodies naturally run on approximately 24-hour cycles. Just like we have time zones so that we can keep timing consistent across the world, we also each have a system in our body that helps keep our physiological timing in check. This “master” clock is in the brain's hypothalamus and is called the suprachiasmatic nucleus (SCN). It can sync time throughout the body through hormonal and chemical signals.

Our internal clocks regulate many bodily processes that we know are important for health, such as our sleep-wake cycles, and regulate the physiology of our body in several ways, from our liver function to our immune system. These clocks are disrupted in many of the most devastating human diseases, such as cancer, diabetes, neurodegenerative disorders (i.e. Alzheimer's disease), psychiatric disorders, and heart disease.

What sets the time for the SCN? There are many environmental cues that keep us “on time”, such as temperature, food, and socialization, but one of the most important is light. The SCN receives input from specialized cells in the retina that relay light as a signal that the SCN can communicate to the rest of the body. Thus, light disruption can have catastrophic effects on the functionality of our biological clocks.

We are now gaining insight into the importance of keeping a healthy biological clock as a way to prevent, slow down, and even treat disease. And as we do, it is becoming clear that DST is harmful to our health.

While the body clock gradually adjusts in response to light changes as the earth rotates and the seasons change, the sudden change of time that comes with the beginning and end of DST can have substantial impacts on our body. Incidences of heart attacks increase around the time change in both spring and fall. Other examples of the poor health outcomes of DST include increases in traffic accidents, less sleep that can translate into higher workplace injury rates, and increases in emergency hospital visits.

One study has also shown that people can not ever really adjust to DST, and that it interferes with our natural adaptation to the changing seasons. These acute effects permeate society and have both economic and physical costs to who inhabit places that use DST.

The chronic health effects of DST speak to a larger issue, which is that disrupting the body's natural rhythm negatively affects our health. Our bodies use a plethora of signals to keep our body on time. Hormonal cycles (the increases and decreases in hormones across the day) are shifted by light, and when out of sync these can have profound effects on our ability to process the energy we need from food and even get a good night's rest. That's why jet lag can be so hard to recover from.

In a retrospective study, it was shown that during DST adolescents suffered from a large misalignment of their social and biological clocks and that this misalignment had an influence on sleep, mood, and behavior in the long term. A discrepancy in social and biological clocks is associated with risk of endocrine and cardiovascular disorders. Even decrease in life expectancy can be attributed to biological clock disruption.

Should we then stick to standard time throughout the year, rather than have DST year-round? This comes down to the use of time zones. While we may need them to function in a global society, even time zones cause some people to live on a different time than "solar time," the time of day calculated from the sun's position in the sky. A particular time zone's clock time is set most closely to the eastern edge of the time zone's solar time. So, even when on standard time, people on the western edge of that time zone can be misaligned about an hour from their local solar time (here's a calculator to determine your local solar time). This discrepancy is exacerbated even more during DST. It has even been shown that cancer risk can increase depending on east-west positioning in a time zone. While standard time is not a perfect system, it is our best option to support biological clock alignment in a modern society where we can not just live based on the time of the sun.

There are negative health consequences to using DST, with very little benefit. Changing to year-round standard time is a relatively simple yet profoundly effective way to give people a chance to keep up a more coordinated biological clock. Experts who have been studying biological clocks for decades agree. So when "falling back" tonight, let's hope that one day we will never have to spring forward again. ✨