

Testimony for the House Committee Public Hearing on Daylight Saving Time Legislation

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Dr. Indira Gurubhagavatula, MD, MPH, Professor of Medicine, Sleep Medicine, University of Pennsylvania

Introduction

I express my thanks to the Members of the Pennsylvania House Intergovernmental Affairs & Operations Committee for the work you are doing and for this opportunity. As a sleep medicine specialist, my goal is to understand and improve sleep health. I express my opinion in this capacity.

I strongly support HB 119 (Diamond), which would end the observance of daylight saving time in Pennsylvania. This recommendation is in the best interests of the physical, behavioral, and mental health of Pennsylvanians. The recommendation to eliminate year-round clock switching, and adopt permanent standard time was put forth by the American Academy of Sleep Medicine in 2020; I served as senior author of that publication. The recommendation was reiterated in 2024, and included additional, interim supportive data. The statement has been endorsed by more than 20 leading professional organizations, including the National Sleep Foundation, the Sleep Research Society, the American Thoracic Society, National PTA, National Safety Council, Society for Research on Biological Rhythms and the World Sleep Society (see Table 1).

Table 1. Professional Organizations Endorsing Permanent Standard Time

American Academy of Sleep Medicine	Michigan Academy of Sleep Medicine
American Academy of Cardiovascular Sleep Medicine	Montana Sleep Society
American Academy of Dental Sleep Medicine	National PTA
American Academy of Otolaryngology-Head and Neck Surgery	National Safety Council
American Association of Sleep Technologists	National Sleep Foundation
American College of Chest Physicians (CHEST)	Sleep Research Society
American College of Lifestyle Medicine	Society for Research on Biological Rhythms
American Medical Association	Society of Anesthesia and Sleep Medicine
American Society for Metabolic and Bariatric Surgery	Society of Behavioral Sleep Medicine
American Thoracic Society	Southern Sleep Society
Dakota Sleep Society	World Sleep Society

Biological Rhythms

Human beings have internal biological rhythms. There are numerous biological rhythms in the body, in addition to the sleep-wake cycle: for example, when we are best at thinking, solving problems, eating, exercising, and when various hormones get released, and when we are best able to fight infections. These rhythms are controlled by internal pacemaker (clock). There is one “master clock” in the brain, and there are other clocks in various organs throughout the body. There are two other clocks at play, external to the human body. One is the solar clock – which relates to the timing of sunrise and sunset. The third clock is our “social clock” – which determines when we have to go to work or school. Our bodies work best when all of these clocks are aligned.

How the master clock is set

Our master clock is set by many environmental cues, such as when we eat, play, exercise, and work. The strongest environmental cue to set this clock is light. The impact of light exposure on setting our internal

rhythms is not constant throughout the day; the timing of the light exposure matters. **Dim light in the evening** activates specific cells in the eye, which then serves as a signal for the brain to **release melatonin**, the “hormone of darkness.” Melatonin signals the brain that it is time to sleep. Melatonin levels rise through the night, peak at around 3-4 AM, when we are in deep sleep, and fall thereafter. Bright light in the morning turns off melatonin. Therefore, **our biology dictates that morning light and evening darkness are present for healthy synchronization (“circadian entrainment”) of our internal sleep-wake rhythm to the solar day/night cycle.**

Human biology better aligns with standard time (“natural time”)

Under standard time, there is more light in the morning, and darkness in the evening. Both conditions are required for best alignment of our internal rhythms with the solar clock, and for healthy timing of melatonin secretion. **Standard time allows the timing of light to occur in a way that is healthiest for melatonin secretion, which controls our internal sleep-wake rhythms.**

Under daylight saving time (“fast time”), we are forced to wake up an hour earlier, when mornings are darker, and evenings are brighter. **Morning darkness and evening light delay the release of melatonin, which delays the sleep cycle.** Daylight saving time therefore allows light to enter the eye at times that are **opposite of what is best for human biology.**

The Consequences of “Spring Forward”

Short term effect: sleep deprivation

Data from the Centers for Disease Control show that Americans are chronically sleep deprived. During the second Sunday in March, when clocks “spring forward,” we are forced to awaken an hour earlier. **This abrupt loss of an hour of sleep has many consequences in the short term:** an increase in car accidents from sleepiness, with a **6% increase in fatal car crashes.** There are also more hospital admissions, ED visits, heart attacks and episodes of heart rhythm abnormalities (such as atrial fibrillation). Abnormal blood pressure readings, cellular dysfunction, and inflammation have also been demonstrated.

Long-term effects: chronic circadian misalignment; sleep deprivation; harms to physical and mental health and safety

Additionally, ongoing exposure to bright light in the evening delays melatonin secretion, which delays sleep time. This **delay in our sleep cycle can persist throughout the DST period, and cause a chronic misalignment between our internal rhythm and our work/school schedules clocks.** Since individuals still have to maintain early morning attendance at school or work, sleep opportunity also becomes curtailed, and **chronic sleep deprivation can persist for weeks or months** in addition to circadian misalignment. Some people never fully adapt to daylight saving time. The effects tend to be worst in the western-most areas within a given time zone, where sunset and sunrise occur at even later clock times than in more eastern areas.

Sleep-deprived individuals are more likely to oversleep miss work or arrive late. They also tend to choose poor coping mechanisms, such as unhealthy foods, caffeine or other stimulants. They are at a higher risk for chronic, serious health conditions including unhealthy weight gain, obesity, and type 2 diabetes mellitus, heart disease, depression, visits to EDs and hospitals, and even cancer. One finding is the 12% increase in breast cancer rates along the western edge of time zones. Symptoms of insufficient sleep are also possible, such as headaches, stomach complaints, more missed days at work or school, and impaired brain functions, including reaction time, muscle coordination, processing speed, and the ability to process large amounts of information and make decisions quickly.

Depression deserves mention. Some people feel that the change to standard time in the fall worsens depression. This is difficult to attribute specifically to the change to standard time alone. 1) The numbers of hours sunlight (“photoperiod”) shortens in the winter as a function of northern latitude and the axial tilt of the earth, which would occur under either condition 2) the change would be less abrupt if we did not have DST in the summer; 3) the accepted treatment for depression is morning light, which occurs in permanent standard time rather than in daylight time; 4) when the US tried to legislate permanent DST in 1974, many adults found dark mornings even more odious than dark evenings, which led to a repeal of the law.

Some groups are more vulnerable to the harmful effects of daylight saving time than others

Adolescents: Daylight saving time attenuates the benefits of later secondary school start times. Among teens, chronic sleep deprivation worsens depression, anxiety and suicidality. Data show an 11% reduction in suicidality with each additional hour of sleep. Data from the Pennsylvania Youth Survey (PAYS, 2021) shows alarming rates of depression and suicidal ideation in Pennsylvania teens.

Night owls: those who tend to prefer late bedtimes and wake up times will find it harder to entrain their circadian rhythms under conditions of evening bright light and morning darkness, which occur in DST.

Workers whose shifts start early, including emergency workers, farmers, postal service workers, parents of young children, health workers, and law enforcement officers would also be disproportionately impacted.

Some religious groups that fast or pray according to sunrise/sunset also find DST challenging.

Individuals who live in more western regions of the time zone would experience greater effects due to even later sunrise and sunset.

The past can inform the future

Some countries tried permanent DST and then repealed it – these include Germany, Queensland, Australia, and Russia. Mexico voted in 2022 to stop seasonal clock changes in favor of permanent standard time. In January 1974, President Nixon signed into permanent daylight saving time into law. Since students had to wait for buses in pitch darkness during winter mornings, some **children died after being struck by vehicles**; adults also found that **commuting during pitch darkness on winter mornings was worse than dark winter evenings**. Farmers also struggled – sunrise dictates dairy cattle's readiness to be milked, and DST added logistical challenges to their work. **Due to tremendous public outcry, year-round DST was therefore repealed in 10/1974 by President Ford after less than one year.**

The Call to Action

As endorsed by numerous professional societies listed above, I support HB 119 (Diamond), which calls for an end to seasonal time changes, and to adopt permanent, year-round standard time.

Thank you for your time and for considering this testimony.

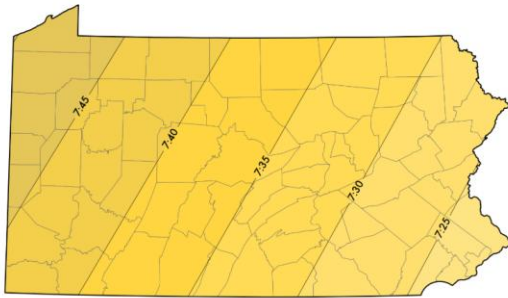
Sincerely,



Dr. Indira Gurubhagavatula, MD, MPH
Professor of Medicine, Sleep Medicine
University of Pennsylvania

Permanent Standard Time (Natural Time) Preserves Morning Light

Time of Latest Sunrises

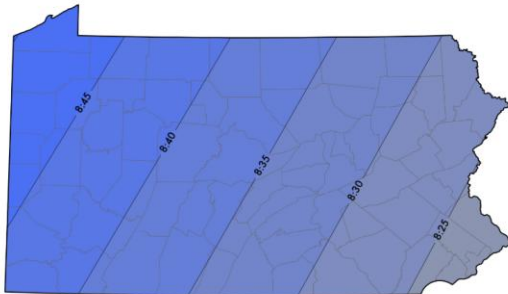


Days with Post-8am Sunrise

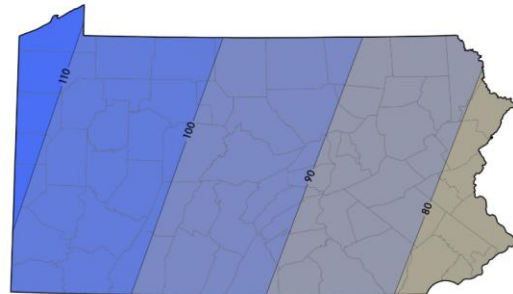


Permanent Daylight Saving (Fast Time) Makes Sunrise Too Late

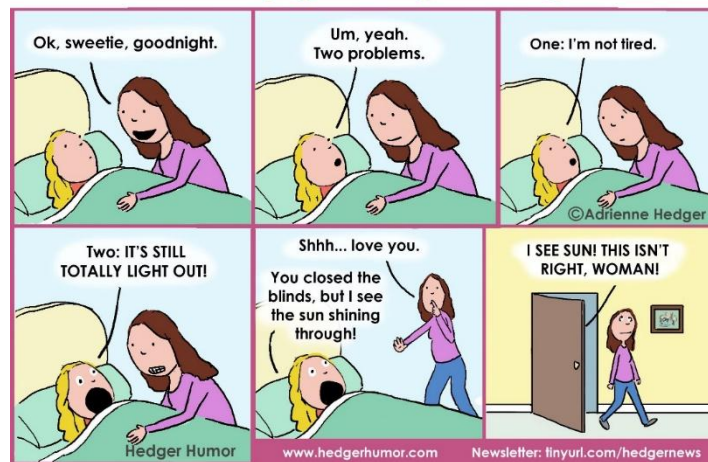
Time of Latest Sunrises



Days with Post-8am Sunrise



When Daylight Saving Time Begins



References

1. Permanent standard time is the optimal choice for health and safety: an American Academy of Sleep Medicine position statement (2024)
2. Daylight saving time: an American Academy of Sleep Medicine position statement (2020)
3. <https://savestandardtime.com/maps/?j=pa>