

Why You Should Have Heart Surgery in the Afternoon

And other shocking new discoveries about how your body's internal clock can help you live longer.

[Jacqueline Detwiler](#) Dec 26, 2018



“You know how Carl Sagan said that we have billions of stars? Well, we have billions of clocks,” says Carrie Partch. “Someday I think there’s going to be this palm-to-forehead moment where we all say: I cannot believe we didn’t understand that every form of life on this planet has a clock that links us to Earth and its terrestrial day.”

Then Partch led a mindfulness meditation outside the temple at Burning Man while celestial gongs rang to celebrate a new day’s rising sun. Just kidding. Partch is a biochemist at the University of California, Santa Cruz, who specializes in circadian rhythms, which is not only an actual research field, but one whose adherents won the 2017 Nobel Prize in Physiology or Medicine. In the 1980s

and 1990s, the three scientists who received the award figured out how genetic time counters in cells aligned biological function to the 24-hour solar day. Particularly over the last couple of years, the work has solidified into a body of research that indicates timing can affect processes as diverse as sleep, metabolism, and cell growth.

Apart from jet lag, which is when the body's internal schedule temporarily doesn't match the schedule of the outside world, why do circadian rhythms matter enough for hundreds of researchers to study them? It turns out that every cell in the human body contains the genetic time counters the Nobel prizewinners found, and they control the expression of roughly half the genome, turning various functions on and off as needed. If the schedules of various organs, muscles, and glands get even slightly out of whack, you can develop depression, anxiety, sleep problems, diabetes, obesity, cardiovascular disease, or cancer. "Pretty much every nasty thing you can think of," says Partch.

But how do your clocks get out of whack? More importantly: How do they stay in whack? Usually, the body's billions of clocks are synchronized by a master clock in the brain that is activated by light. If you don't get the right amount of light at the right times of day (dawn and dusk, generally), your clocks can get screwy. But there are other causes as well: Clocks keep worse time as we age, and they can become desynchronized by poor eating schedules or natural genetic variation. Experiments on animals in which certain molecular clock genes were deactivated in the pancreas showed that the animals acted normally, only to later develop diabetes.

Molecular clocks can even affect the potency of medication. "There are several different mechanisms—metabolism, so if you take a drug at the wrong time, it might be metabolized too quickly and cleared," says John Hogenesch, a chronobiologist at Cincinnati Children's Hospital Medical Center. "The second is transport—it may not be transported to the appropriate cell or organ type. And the third is the actual target [could be turned off at that time]." A current clinical trial at Washington University in St. Louis is testing whether administering chemotherapy for brain cancer when certain critical clock genes are at their peak could improve survival rates.

While chronobiologists continue to unravel the complete mysteries of time–cellular interactions, the oldest advice remains the best: Get more sleep and spend more time outdoors. Chakra cleansing not required (for now).

Ways To Reset Your Molecular Clocks

Eat all your food within 10 hours: Mice missing certain circadian clock genes are prone to obesity, but when they keep a tight eating schedule they remain lean.

Ask your doctor when to dose: The effectiveness of low-dose aspirin therapy, certain statins, and even chemotherapy can be greatly affected by when you take the medicines.

Get your flu shot in the morning: A 2016 study found that the immune system created four times the antibodies to a flu shot when it was given in the morning.

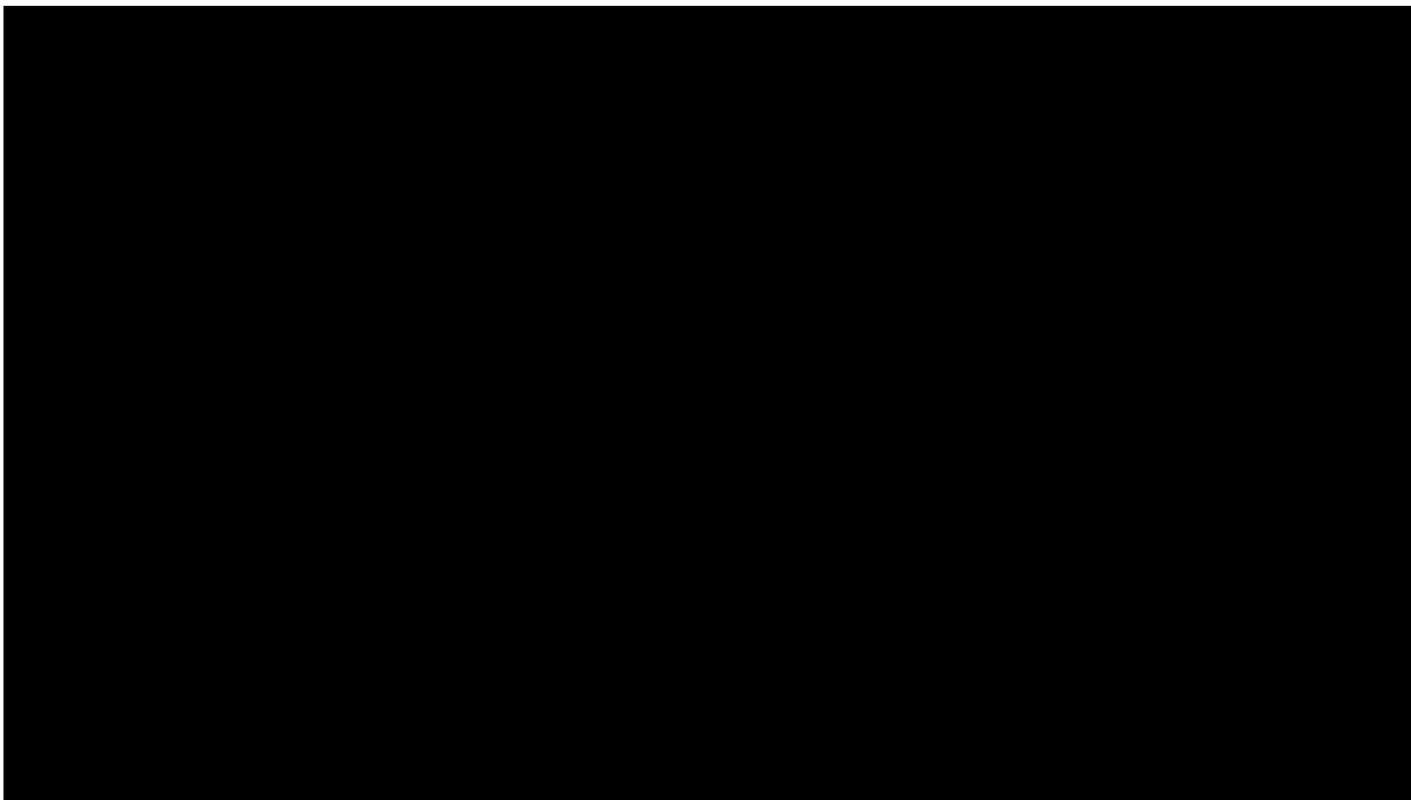
Have heart surgery in the afternoon: A 2017 study found that heart attacks were half as likely in patients who had valve replacements later in the day.

Skip the night shift: The World Health Organization classifies circadian-disrupting shift work as a class 2A “Probable Carcinogen.”

Go camping: A researcher at the University of Colorado, Boulder, recorded students’ light exposure on a camping trip and found their clocks returned to normal within two days.

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