

Circadian rhythm: How do our sleeping cycles affect how we experience pain?

In a [recently published study](#), scientists led by Claude Gronfier at the Lyon Neuroscience Research Centre in France have finally shed light on changing pain sensitivity, suggesting that our circadian clock strongly shapes these shifts, with a characteristic peak and trough of intensity at different times of day.

Even people who can't dance have internal rhythms thrumming through every system in their body. Known as circadian rhythms, these biological processes tune their activity to rise and fall at precise times across the day, driven by the body's internal clock. They influence pretty much every bodily system, exerting control over "almost all aspects of our physiology and behavior," says Lance Kriegsfeld, a circadian biologist at the University of California, Berkeley.

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The work by Gronfier and his team revealed the influence of these rhythms on pain by showing that a short, painful heat stimulus was perceived to be most painful around 3 am and least painful at approximately 3 pm.

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To uncover pain's rhythmic nature, Gronfier's team found 12 healthy young men who agreed to undergo the protocol for 34 hours. Every two hours, the team tested their pain sensitivity using a device placed on the forearm that slowly increased in temperature by one degree Celsius until they reported pain. Participants usually stopped the device before it reached around 46 degrees Celsius (115 degrees Fahrenheit). The participants were also tested with the device set at specific temperatures (42, 44, and 46 degrees Celsius), and then asked to rate on a visual scale the level of pain they felt.

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