

# Will ketamine treat your depression? Check your activity monitor

15 August 2017



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During a depressive episode, people often report having reduced energy, feeling slowed down and having reduced interest in activities. As their mood lifts, energy and activity return to their usual levels. A new study in *Biological Psychiatry* reports altered measures of daily activity in patients whose depressive symptoms improved in response to the fast-acting antidepressant ketamine. The differences were present before starting treatment, suggesting that activity patterns may help identify patients who would benefit from the drug.

In the study, first author Dr. Wallace Duncan and his colleagues from the Experimental Therapeutics and Pathophysiology Branch at the National Institute of Mental Health in Bethesda, Maryland used wristwatch activity monitors to examine measures of circadian timekeeping systems, including the timing and levels of activity. The 51 patients included in the study had either [major depressive disorder](#) or bipolar disorder, and all of the patients had [depressive symptoms](#) that had not responded to previous treatment attempts.

Duncan and his colleagues showed that patients

who responded to a single infusion of ketamine initially had more activity earlier in the day and lower activity later in the day than patients who did not respond to ketamine. "In other words, their daily activity clock was shifted forward," said Dr. John Krystal, Editor of *Biological Psychiatry*.

Responders also had advance-shifted timing of their activity on the first day after the treatment, and increased overall activity levels on the third day, consistent with the notion that activity levels are part of the clinical response to ketamine.

"These findings are the first clinical results to suggest that trait-like circadian activity patterns are associated with rapid [mood](#) response to ketamine," said Dr. Duncan. Altered measures of circadian timekeeping on the third day suggest that changes in circadian circuits may mediate ketamine's continued effects on mood.

In addition, the differences in [activity levels](#) before and after treatment suggest biological differences in the circadian systems that regulate activity between people who respond to the drug and those who don't. The authors suggest that the underlying differences may help predict ketamine's effects on mood.

"It would be nice if daily patterns of activity could be used clinically to identify people who might respond to ketamine and to monitor clinical improvement," said Dr. Krystal.

According to Dr. Duncan, the study is also important because it shows that rapid-acting treatments such as ketamine can provide key insights into the relationship between sleep and [circadian rhythms](#), activity and mood response. The activity signature produced by ketamine suggests that the clock gene machinery that controls circadian rhythms may be linked to the type of depression that responds to ketamine. In addition, depressive symptom scores were associated with

decreased [activity](#) and increased sleep quality on the first night after the infusion, indicating that improved sleep quality may be key to [ketamine's](#) rapid mood effects.

**More information:** Wallace C. Duncan et al. Motor-Activity Markers of Circadian Timekeeping Are Related to Ketamine's Rapid Antidepressant Properties, *Biological Psychiatry* (2017). [DOI: 10.1016/j.biopsych.2017.03.011](#)

Provided by Elsevier

APA citation: Will ketamine treat your depression? Check your activity monitor (2017, August 15) retrieved 27 October 2021 from <https://medicalxpress.com/news/2017-08-ketamine-depression.html>

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