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### Will ketamine treat your depression? Check your activity monitor

*Findings from a new study in Biological Psychiatry*

**Philadelphia, PA, August 14, 2017** – 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.

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### Notes for editors

The article is "Motor-Activity Markers of Circadian Timekeeping Are Related to Ketamine's Rapid Antidepressant Properties," by Wallace C. Duncan Jr., Elizabeth Slonena, Nadia S. Hejazi, Nancy Brutsche, Kevin C. Yu, Lawrence Park, Elizabeth D. Ballard, and Carlos A. Zarate Jr. (<http://dx.doi.org/10.1016/j.biopsych.2017.03.011>). It appears in *Biological Psychiatry*, volume 82, issue 5 (September 2017), published by [Elsevier](#).

Copies of this paper are available to credentialed journalists upon request; please contact Rhiannon Bugno at [Biol.Psych@UTSouthwestern.edu](mailto:Biol.Psych@UTSouthwestern.edu) or +1 214 648 0880. Journalists wishing to interview the authors may contact James McElroy at [NIMHpress@mail.nih.gov](mailto:NIMHpress@mail.nih.gov) or +1 301 443 4536.

The authors' affiliations and disclosures of financial and conflicts of interests are available in the article.

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The journal publishes novel results of original research which represent an important new lead or significant impact on the field, particularly those addressing genetic and environmental risk factors, neural circuitry and neurochemistry, and important new therapeutic approaches. Reviews and commentaries that focus on topics of current research and interest are also encouraged.

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