

# Addiction: Can you ever really completely leave it behind?

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It is often said that once people develop an addiction, they can never completely eliminate their attraction to the abused substance. New findings provide further support for this notion by suggesting that even long-term abstinence from cocaine does not result in a complete normalization of brain circuitry.

Scientists are currently trying to answer some of the 'chicken and egg' questions surrounding the abuse of drugs. In particular, one of those questions is whether individuals who abuse psychostimulants like cocaine are more impulsive and show alterations in [brain reward](#) circuits as a consequence of using the drug, or whether such abnormalities existed prior to their drug use. In the former case, one might expect brain alterations to normalize following prolonged drug abstinence.

To address these questions, Krishna Patel at Institute of Living/Hartford Hospital and colleagues compared neural responses between three groups of people who were asked to complete a task that resembles bidding on eBay items.. The 3 groups consisted of 47 healthy controls, 42 currently drug-abusing cocaine users, and 35 former cocaine users who had been abstinent an average of 4 years. They also compared all three groups on their levels of impulsivity and reward responding.

They found that active users showed abnormal activation in multiple [brain regions](#) involved with reward processing, and that the abstinent individuals who were previously cocaine dependent manifested differences in a subset of those regions. Both current and former cocaine

users displayed similarly elevated impulsivity measures compared to healthy controls, which may indicate that these individuals had a pre-existing risk for addiction. Indeed, the degree of impulsivity correlated with several of the [brain activation](#) abnormalities.

These findings suggest that prolonged abstinence from cocaine may normalize only a subset of the [brain abnormalities](#) associated with active drug use.

"The knowledge that some neural changes associated with addiction persist despite long periods of abstinence is important because it supports clinical wisdom that recovery from addiction is a lifelong process," says Dr. John Krystal, Editor of *Biological Psychiatry*. "Further, it is the start of a deeper question: How do these persisting changes develop and how can they be reversed?"

The authors agree that further studies will be needed to investigate such questions, including the continued attempt to determine the extent to which differences in former [cocaine users](#) reflect aspects of pre-existing features, exposure to cocaine, or recovery.

**More information:** The article is "Robust Changes in Reward Circuitry During Reward Loss in Current and Former Cocaine Users During Performance of a Monetary Incentive Delay Task" by Krishna T. Patel, Michael C. Stevens, Shashwath A. Meda, Christine Muska, Andre D. Thomas, Marc N. Potenza, and Godfrey D. Pearlson ([DOI: 10.1016/j.biopsych.2013.04.029](#)). The article appears in *Biological Psychiatry*, Volume 74, Issue 7 (October 1, 2013)

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