

Relapse or recovery? Neuroimaging predicts course of substance addiction treatment

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Joshua Brown Credit: Indiana University

An Indiana University study has provided preliminary evidence that by measuring brain activity through the use of neuroimaging, researchers can predict who is likely to have an easier time getting off drugs and alcohol, and who will need extra help.

"We can also see how brain activity changes as people recover from their addictions," said Joshua Brown, assistant professor in the Department of Psychological and [Brain Sciences](#) at Indiana University Bloomington, part of the College of Arts and Sciences.

The chronic occurrence of relapse underscores the need for improved methods of treatment and relapse prevention. One potential cause for

relapse is deficient self-regulatory control over behavior and decision-making. Specifically this lack of self-regulatory ability in substance dependent individuals has been associated with dysfunction of a mesolimbic-frontal brain network. Reduced activity within this self-regulatory brain network has previously been implicated in relapse, but the specific relationship between this network, self-regulatory ability and recovery is yet to be determined.

The current study explores neurophysiological and cognitive indicators of self-regulatory ability in a community-based sample of substance dependent individuals during the first three months of [addiction treatment](#). The study tests participants' risk-taking inclinations through what is called a Balloon Analog Risk Task, a game in which the participants can decide whether to add increasing amounts of air to a balloon, gaining rewards until it pops. Those who took greater risks were shown to have reduced brain activity. By the same token, those who took less risk showed greater [brain activity](#). By three months those who were successful in treatment also demonstrated a pattern of [brain activation](#) that coincided with the [risk level](#) of cues during the balloon risk task decision-making. In individuals who relapsed, risk-related activation was limited to certain [brain regions](#), possibly signaling the anticipated reward rather than the risk of negative outcome.

The study, "Neural predictors and indicators of successful early recovery in substance dependent individuals," will be discussed from 11 a.m. to noon on Sunday in Hall F-J. Co-authors are S.E. Forster; and Peter R. Finn, also of the Department of Psychological and Brain Sciences.

Provided by Indiana University

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