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### Aerobic Exercise Decreases the Rewarding Effects of Cocaine

Exercise is known to produce a host of psychological effects that are associated with reductions in substance use and abuse. For instance, long-term voluntary exercise increases measures of self-esteem, well-being, and decreases measures of depression and anxiety. In addition, several studies have shown that participation in activities that promote physical fitness is associated with lower incidence of tobacco and substance use among adolescent populations. Despite these promising findings, remarkably little clinical and laboratory data exist that support a relationship between exercise and a decreased likelihood to engage in drug-seeking behavior. In an article published in the current issue of *“Drug and Alcohol Dependence”*, researchers found that in female rats, chronic exercise decreases the rewarding effects of cocaine.

Mark Smith of Davidson College (Davidson, NC) and colleagues conducted a study using a progressive ratio schedule of reinforcement (a rodent model for assessing reward) to examine the effects of chronic aerobic exercise on sensitivity to the rewarding effects of cocaine. In their study, the authors obtained female rats at weaning and divided them into two groups. In the first group, rats were housed individually in cages that permitted no exercise beyond normal cage activity. In the second group, rats were housed in similar cages which had a running wheel affixed to the interior of the cage. After 6 weeks under these conditions, rats were implanted with catheters and trained to self-administer cocaine. Once self-administration was acquired, cocaine was made available on a progressive-ratio schedule and breakpoints (amount animals will work for each cocaine delivery) were obtained for various doses of cocaine. Although sedentary and exercising rats did not differ in the time to acquire cocaine self-administration, breakpoints were significantly lower in exercising rats than sedentary rats when responding was maintained by both low and high doses of cocaine. These results suggest that exercise decreases the rewarding effects of cocaine and has protective effects against cocaine self-administration. The authors report that these findings have important implications for exercise as an effective intervention in drug abuse prevention and treatment programs.

Drug and Alcohol Dependence is the official journal of the College on Problems of Drug Dependence ([www.cpdd.org](http://www.cpdd.org)), the largest and oldest organization for the scientific study of drug dependence. The peer-reviewed Drug and Alcohol Dependence ([www.elsevier.com/locate/drugalcdep](http://www.elsevier.com/locate/drugalcdep)) is published by Elsevier Science Inc., a leading publisher of scientific, technical, and medical journals, books, and reference works. Elsevier Science is a member of the Reed Elsevier PLC group ([www.reedelsevier.com](http://www.reedelsevier.com)), a leading publishing and information business.

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