

# FACT SHEET: ADDICTION & STIMULANTS

Grace E. Jackson, MD  
March 18, 2006

According to several recent publications prepared by corporately sponsored clinicians, ADHD medications (predominantly, stimulants) “do not increase, but appear to decrease the risk for substance abuse.” It would be difficult to imagine a more misleading or distorted presentation of the pertinent facts.

In reality, treatment with stimulant medications – whether it is initiated in early childhood, adolescence, or adulthood – appears to re-wire the brain in a way which increases the likelihood of future dependence upon chemical substances. Four studies will be briefly described here, challenging the veracity of the pharmaceutical industry’s continuing media barrage, and presenting an argument for a more responsibly informed standard of care.

## The Northern California Study

The largest and longest analysis of ADHD outcomes, to date, is the Northern California study performed by Dr. Nadine Lambert’s research team at the University of California (Berkeley). Begun in 1973-1974, the study involved a 28-year investigation of 492 children recruited from classrooms throughout the Bay Area. Particular strengths of this study were the collection of data from multiple sources (parents, physicians, teachers, patients) at multiple points in time (eight separate interviews with the subjects and controls). A major finding of the study was a positive association between exposure to stimulants in childhood and the eventual *dependence* upon nicotine and cocaine:

	Effect of ADHD & Pre-Exposure to Stimulant			
	ADHD		Stimulants	
	no	yes	no	yes
Tobacco dependent	22%	45%	25%	<b>45%</b>
Cocaine dependent	11%	23%	12%	<b>24%</b>

The duration of stimulant exposure in childhood was positively correlated with future addiction to nicotine and cocaine:

(Lambert, 1998)

Of ADHD Children receiving:

	No stimulant	stimulant < 1 year	stimulant for 1 yr or more
Tobacco dependent	32%	39%	<b>49%</b>
Cocaine dependent	15%	18%	<b>27%</b>

Of the original 492 children (282 with hyperactivity, 210 controls) in the Northern California study, 202 reported some cocaine use by the age of 40. Treatment with stimulants in early childhood was associated with a ***two-fold higher risk of cocaine dependence***, an association which was six times stronger than the link between conduct problems and later dependence upon cocaine.

The significance of Lambert's findings rests partly upon the fact that the use of cocaine and nicotine were carefully monitored *prospectively* over time. In all cases, substance abuse commenced *after* the initiation of treatment with stimulant medications. This suggests that prescription stimulants re-wired the subjects' brains in ways which *sensitized* neural pathways to future drug experimentation or compulsive use [see Robinson and Berridge, as referenced below].

### **The Barkley Study**

Although the authors of a second large investigation (Barkley et. al.) have done their best to deny it, the raw data from their 15-year study support the theory of neural sensitization. In this Wisconsin, clinic-based exploration of 158 ADHD children, early exposure to stimulants was associated with a ***five-fold higher likelihood of lifetime cocaine use*** [p=0.037], and with the ***higher frequency of cocaine use as a young adult*** [p = 0.059]. The continuation of treatment with stimulants during adolescence was associated with similar outcomes: ***two-fold higher likelihood of cocaine use*** [p=0.016], and a ***higher frequency of cocaine use as a young adult*** [p = 0.043]. Tragically, the Barkley study has been misinterpreted in the medical literature as providing proof that stimulants do not increase the risk of later addiction, while conduct disorder and ADHD symptoms do. This confusion presumably arises from a failure of clinicians to carefully read the published study *in toto* and to contemplate the numerous flaws and statistical manipulations which have permitted the study's authors to declare "that stimulants do not lead to an increased risk of adult substance abuse."

(Barkley et. al., 2003)

Lifetime Use of Cocaine

Medicated with stimulants in early childhood	<b>26%</b>	p = 0.037
Not medicated with stimulants in early childhood	5%	
Medicated with stimulants in high school	<b>40%</b>	p = 0.016
Not medicated with stimulants in high school	20%	

### Recent College Surveys – Childhood Treatment Does Not Prevent Substance Abuse

Given the fact that the ADHD epidemic in America exploded in the early 1990s, it stands to reason that many children from this age group have only recently graduated from high school and matriculated in college programs. Several cross-sectional surveys of undergraduate students lend further support to the theory that pre-exposure to stimulants changes the brain in ways which make addictions more, rather than less, likely.

For example, a 2003 survey administered to undergraduates at the University of Michigan (n = 9161) revealed that 8% of the respondents had used prescription stimulants illicitly in the course of their lifetime (five per cent within the past year). Among students who had been diagnosed with ADHD, the initiation of treatment with stimulants (versus no stimulants) during middle school, high school, or college was associated with a higher likelihood of illicit stimulant use, *and with a two- to four-fold higher likelihood of cocaine use over the course of the past year*. A 2001 survey administered to undergraduate students at the University of Charleston (n = 334) revealed that 25% of the students who had received stimulants for ADHD had used their medications at some time to “get high,” further disproving the hypothesis that treatment with medication decreases the risk of future stimulant abuse or dependence.

In conclusion, the comments of certain opinion leaders in the field of psychiatry have been egregious and misleading. If these opinions continue to be accepted uncritically and continue to be widely disseminated, they could have dire consequences from a public health perspective. *The published findings from several large studies of ADHD children who have been followed into early or middle adulthood suggest that treatment with prescription stimulants increases, rather than prevents, the likelihood of certain chemical dependencies*. The sensitization theory of addiction predicts that some substances have the potential to re-wire the brain in ways which enhance the propensity for drug liking or drug wanting. Based upon the available research evidence, the sensitization theory for stimulants has been impressively affirmed in non-human and human subjects. It is time for physicians to incorporate this knowledge into their daily practices; to modify the information which they may now be sharing with their patients and with patients’ families; and to elevate the quality of medical care, accordingly.

## References

Barkley, R.A., Fischer, M., Smallish, L., and Fletcher, K. (2003). Does the Treatment of Attention-Deficit/Hyperactivity Disorder With Stimulants Contribute to Drug Use/Abuse? A 13-Year Prospective Study. *Pediatrics*, *111*, 97-109.

Faraone, S.V., and Wilens, T. (2003). Does Stimulant Treatment Lead to Substance Use Disorders? *Journal of Clinical Psychiatry*, *64* (suppl 11), 9-13.

Fischer, M., and Barkley, R.A. (2003). Childhood Stimulant Treatment and Risk for Later Substance Abuse. *Journal of Clinical Psychiatry*, *64*, (suppl 11), 19-23.

Lambert, N., and Hartsough, C.S. (1998). Prospective Study of Tobacco Smoking and Substance Dependence among Samples of ADHD and Non-ADHD Participants. *Journal of Learning Disabilities*, *31*, 533-544.

Lambert, N.M. (2005). Contribution of childhood ADHD, conduct problems, and stimulant treatment to adolescent and adult tobacco and psychoactive substance abuse. *Ethical Human Psychology and Psychiatry*, *7*, 197-221.

Lambert, N.M., McLeod, M., Schenk, S. (in press). Subjective responses to initial experience with cocaine: An exploration of the incentive-sensitization theory of drug abuse. *Addiction*.

McCabe, S.E., Teter, C.J., and Boyd, C.J. (in press). Medical use, illicit use and diversion of prescription stimulant medication. *Journal of Psychoactive Drugs*.

Robinson, T.E., and Berridge, K.C.. (2000). Animal Models in Craving Research -The psychology and neurobiology of addiction: an incentive-sensitization view. *Addiction*, *95* (suppl 2), S91-S117.

Upadhyaya, H.P., Rose, K., Wang, W., O'Rourke, K., Deas, D., and Brady, K.T. (2005). Attention-Deficit/Hyperactivity Disorder, Medication Treatment, and Substance Use Patterns Among Adolescents and Young Adults, *Journal of Child and Adolescent Psychopharmacology*, *15*, 799-809.

Wilens, T.E. (2003). Does the medicating ADHD [sic] increase or decrease the risk for later substance abuse? *Revista Brasileira Psiquiatria*, *25*, 127-128.