

## Marijuana Tied to Addiction, Long-term Cognitive Dysfunction

Deborah Brauser | June 11, 2014

Marijuana use is associated with substantial adverse events, including addiction and long-term cognitive dysfunction, new research suggests.

A review article by investigators from the National Institute on Drug Abuse (NIDA) shows that during intoxication, marijuana can interfere with memory, perception of time, and motor function, which can lead to serious consequences, including motor vehicle accidents. In addition, repeated use during adolescence can result in long-term brain function changes.

Many of these effects "have been determined with a high level of confidence," write the researchers, led by NIDA director Nora Volkow, MD.

They add that legal drugs, including alcohol and tobacco, account for "the greatest burden of disease" because of their widespread exposure.

However, "as policy shifts toward legalization of marijuana, it is reasonable and probably prudent to hypothesize that its use will increase and that, by extension, so will the number of persons for whom there will be negative health consequences," write the investigators.

The review article was published in the June 5 issue of the *New England Journal of Medicine*.

### Focus on the Evidence

According to the researchers, US data show that approximately 12% of persons aged 12 years or older used marijuana in the past year.

"The popular notion seems to be that marijuana is a harmless pleasure, access to which should not be regulated or considered illegal," they write.

Although multiple studies have been conducted, with many showing conflicting results, giving ammunition to the heated debate on whether the substance really is harmful, its regular use during adolescence "is of particular concern."

"Here we review the current state of the science related to the adverse health effects of the recreational use of marijuana, focusing on those areas for which the evidence is strongest," write the investigators.

Their results include the following:

- Approximately 9% of people who experiment with the substance will become addicted.
- One in 6 of those who start using marijuana as teenagers will become addicted.
- Cannabis withdrawal syndrome is real and can make cessation difficult.
- Marijuana addiction increases the risk for using other illicit drugs.



Dr. Nora Volkow

In addition, adults who regularly smoked the substance during adolescence have impaired neural connectivity in areas that involve alertness, awareness, learning, and memory compared with those who have never smoked marijuana.

They also have less functional connectivity in areas that include processing habits and routines and inhibitory control, as well as a significant decline in IQ.

### **Link to Mental Illness?**

Regular use of cannabis has also been associated with an increased risk for depression and anxiety; it has been linked to psychoses (especially in those with a preexisting genetic vulnerability), and it exacerbates the illness in patients with schizophrenia.

"However, it is inherently difficult to establish causality in these types of studies because factors other than marijuana use may be directly associated with the risk of mental illness," note the investigators.

Finally, immediate and long-term exposure to the substance has been found to substantially impair driving ability. But studies on whether it contributes to lung cancer are unclear.

The researchers note that many of the growing problems could be because the THC (tetrahydrocannabinol) content of marijuana increased from approximately 3% in the 1980s to 12% in 2012.

"This increase...raises concerns that the consequences may be worse now than in the past and may account for the significant increases in emergency department visits by persons reporting marijuana use," they write.

"There is also a need to improve our understanding of how to harness the potential medical benefits of the marijuana plant without exposing people who are sick to its intrinsic risks."

*The study authors have reported no relevant financial relationships.*

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