

The Impact of Marijuana on Youth

The effects of marijuana on the developing brain

During adolescence, the brain rewires itself so that we develop the connections we need to function properly as an adult. The brain's pleasure circuits are critically involved in this process, rewarding the adolescent for trying new activities, learning new skills, and taking the risks necessary to grow up. One of the final stages in this process is the maturation of the frontal lobes, which are the areas of the brain responsible for judgment and decision-making. These areas don't mature fully until we are 25 or 26 years old. Substances that directly affect the pleasure circuits disrupt the maturation process, making young people more vulnerable than adults to the psychoactive effects of drugs, including marijuana.

Waiting is important: 13.2% of the those who first tried marijuana at age 14 or younger were abusing or dependent, but only 2.2% of those who first tried marijuana at age 18 or older were abusing or dependent¹.

- An exhaustive meta-analysis in 2004⁵ examined forty-eight previous studies and found that marijuana use is consistently associated with reduced grades and a reduced chance of graduating from school.
- In 2012, 60% of all new marijuana users were under 18¹.
- 13.2% of the those who first tried marijuana at age 14 or younger were abusing or dependent, but only 2.2% of those who first tried marijuana at age 18 or older were abusing or dependent¹.
- The relative dependency rate for marijuana among the general population of regular users is 9% (about 1 out of 11), while the rate for adolescent users is almost 17% (about 1 out of 6) and the rate for heavy users is almost 25% (1 in 4)².

Marijuana users who start using during their early teens and continue to use persistently into adulthood lose as much as 10 points off their IQ scores by the time they reached their late 30s – a period of time during which most people experience an increase in IQ. One study³ found:

- The **decline included all four indicators of IQ**: working memory, processing speed, perceptual reasoning and verbal comprehension. In real-life terms, it would limit the user's abilities in work, sports, and many other daily activities.
- The **average IQ loss for heavy users (daily use) was 8 points**, and for moderate users (more than once per week) it was 6 points. **Even light users showed some loss.**
- **Age of first use** was a key factor in the amount of IQ decline: "...adolescent-onset users showed greater IQ decline than adult-onset cannabis users."
- The declines did not fade over time: "...**impairment was still evident after cessation** of use for 1 year or more."

The myelin, or white matter, in the areas of the brain responsible for the cognitive functions involved in IQ is apparently damaged by using marijuana⁴. Using MRI scans on a matched group of non-users and users (all of whom had started smoking in their early teens and continued smoking until 18 or 19), the study found that the myelin in the brains of marijuana users showed damage while the myelin in non-users' brains did not.

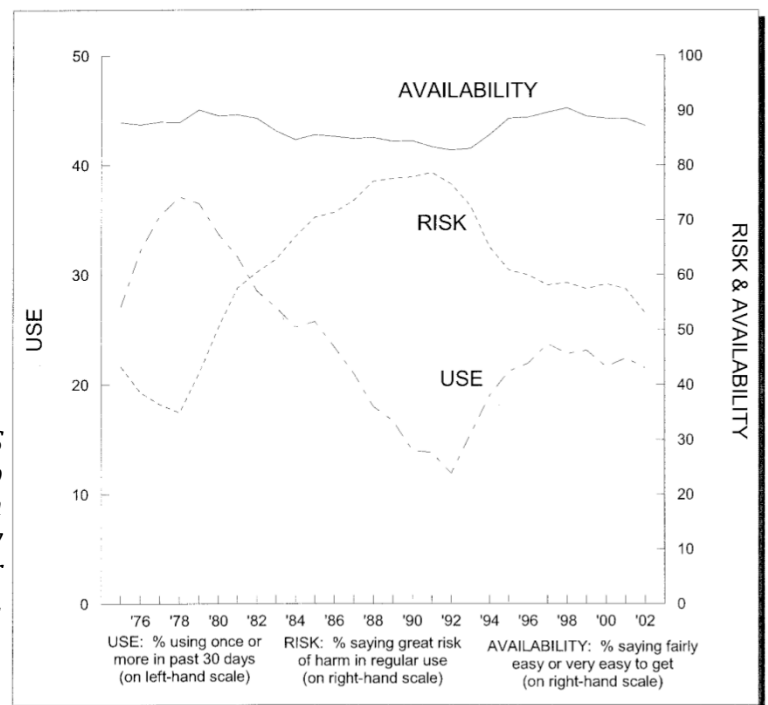
The Current State of Youth Marijuana Use in Vermont

Marijuana is already the most commonly used illegal drug in Vermont. In fact, more teens in Vermont enter treatment with a primary diagnosis for marijuana dependence than for all other illicit drugs combined⁶.

According to the 2013 Youth Risk Behavior Survey (YRBS)⁷:

- 39% of Vermont high school students have ever tried marijuana, while 61% have not.
- 7% reported trying it before age 13.
- 24% reported using it within the past 30 days before the survey, while a full three-quarters of students do not use regularly.
- 6% reported using it between 3 and 9 times in the past 30 days.
- 11% reported using it 10 or more times in the past 30 days.
- 16% reported having driven while under the influence of marijuana in the past 30 days.
- 23% reported riding as a passenger in the past 30 days with someone who had been using marijuana.

Surveys like the NSDUH and the YRBS have shown that teen use goes up when the perception of risk goes down and availability goes up⁸. Other risky behaviors, like driving while using or with a user, also go up.



1. Substance Abuse and Mental Health Services Administration.

Results from the 2012 National Survey on Drug Use and Health: Summary of National Findings, NSDUH series H-46, HHS Publication No. (SMA)13-4795.

2. Wagner, F.A. & Anthony, J.C. *From first drug use to drug dependence; developmental periods of risk for dependence upon cannabis, cocaine, and alcohol.* Neuropsychopharmacology 26, 479-488 (2002).

3. Madeline H. Meier et al *Persistent cannabis users show neuropsychological decline from childhood to midlife*, Proceedings of the National Academy of Sciences (PNAS), 2012 ; published ahead of print August 27, 2012, doi:10.1073/pnas.1206820109

4. Manzar Ashtari, Kelly Cervellione, John Cottone, Babak A. Ardekani, Sanjiv Kumra; *Diffusion abnormalities in adolescents and young adults with a history of heavy cannabis use*, Journal of Psychiatric Research, Volume 43, Issue 3, 189-204, January 2009

5. Macleod, J. et al, *Psychological and social sequelae of cannabis and other illicit drug use by young people: A systematic review of longitudinal, general population studies.* Lancet 363(9421):1579-1588, 2004.

6. Vermont Substance Abuse Treatment Information System. Data online at: www.healthvermont.gov/adap/clearinghouse/documents/AdolescentsbySAandFY.pdf

7. Vermont Department of Health, Youth Risk Behavior Survey 2013; http://healthvermont.gov/research/yrbs/2013/documents/2013_yrbs_full_report.pdf

8. Joffe, Alain, Yancy, Samuel W., 2004, *Legalization of Marijuana: Potential Impact on Youth*, Pediatrics: Official Journal of the American Academy of Pediatrics, 113, e634- e635, Online ISSN: 1098-4275.