

What are the short term effects of marijuana use? In particular, how does marijuana move through the body?

- When marijuana is smoked, the blood supply in the lungs absorbs the hundreds of chemicals in the drug, including its primary psychoactive agent THC. This intoxicated blood supply travels directly to both the brain and the heart, burdening the cardiovascular system by elevating heart rate and disrupting the brain's natural reward system through the drug's intoxicating effects in the brain. Initially, motor coordination, mood, perception, memory and a person's sleep, appetite and breathing may all be adversely affected.
- While primary intoxication wears off within hours of using marijuana, a significantly toxic concentration of marijuana chemicals continues to affect multiple body organs and systems including the hormonal and immune systems, the liver, kidneys, spleen, and testes, and in pregnant women, the placenta so as to reach the developing fetus.
- About half the THC and other marijuana chemicals smoked remain in the direct bloodstream for nearly a day after use of the drug.
- After this period of a day, the bloodstream carries the majority of THC remaining in the body to the liver, where it is broken down into chemical subcomponents that are also psychoactive. While these psychoactive chemical subcomponents will not produce a "high," they are capable of impairing mental and physical function through their intoxication of the body in the liver for days.
- While THC stays in the blood and in bodily organs for days, it remains in the fatty tissues of the body, and most notably those of the brain, for much longer. About 30% of THC ingested can notably impact brain and body function for approximately a week after initial use, and the chemical remains, in smaller portions, within the body for as long as three weeks after use, subtly impairing systems throughout that time.

What are the long-term effects of marijuana use?

- Accumulating evidence suggests that exposure to marijuana during adolescent development can cause long-lasting changes in the brain's reward system as well as the hippocampus, a brain area critical for learning and memory:
 1. A primary effect for one in six teens who use marijuana is addiction. Marijuana is an addictive substance that unnaturally alters the reward system of the brain. While using marijuana in adolescence gives individuals the very highest likelihood that they will become addicted to marijuana and potentially other drugs, there remains a one in 10 risk for addiction to marijuana even into adulthood.
 2. Studies of marijuana users fairly consistently show that these individuals perform worse on neuropsychological tests.
 3. In such studies, mental impairment among marijuana users, compared to these own individual's functioning prior to marijuana use, was evident not just in poorer cognitive test scores but in users' poorer daily functioning, particularly noticeable in problems with memory and attention: easily getting distracted, misplacing things, forgetting to keep appointments or return calls, etc.
 4. Other more recent studies suggest that in adolescence, when the white matter of the brain is most susceptible to damage from the cannabinoids within marijuana, use of the drug weakens the connections between neurons in the brain, possibly contributing to the weakened cognitive functioning seen in long-term marijuana users who began use as teens.

5. In reputable, large-scale studies, persistent marijuana users, and especially those who began to use in adolescence, experienced drops in their own IQ from the teen years through mid-life.
6. Accumulating evidence suggests that long-term, heavy cannabis use may cause enduring neuropsychological impairment like drop in IQ and poorer cognitive performance even after extended periods of abstinence.

In many studies where adolescent use of marijuana resulted in neurological impairments, cessation of marijuana use did not fully restore neuropsychological functioning among adolescent-onset marijuana users.

- Regular marijuana use in adolescence is part of a cluster of behaviors that can produce enduring detrimental effects and alter the trajectory of a young person’s life—thwarting his or her potential.
 1. Teen marijuana use is linked to school dropout, other drug use, and mental health problems.
 2. More severe and enduring impairment is evident among individuals with more frequent, prolonged, “heavy” use and a younger age-of-onset.

How much usage would cause any negative effects over time?

- Firstly, the most important factor in determining negative effects of use over time is not necessarily amount of use, but initiation of use. The earlier someone begins to use a substance, the higher their chances are for drug addiction, including marijuana addiction:
 1. Research shows that young people who begin using marijuana prior to 18 are at heightened risk for neurological impairment than those who begin to use at later ages.
 2. Other research also shows that those who use marijuana first in adolescence are, compared to adult onset users, were twice as likely to suffer emotional problems, and seven times as likely to suffer physical problems from use.
- Studies often compare the physical and psychological health of non-using study participants to participants who have used marijuana in ways described as “regular,” “persistent,” “chronic,” “ongoing,” or “heavy.” More severe and enduring impairment is also always evident among individuals with a younger age-of-onset:
 1. In one study, the negative effects of marijuana worsened dependent on the number of times individuals in the study had been diagnosed with “marijuana dependence.” Dependence on, or addiction to, marijuana is defined as the compulsive and repetitive use of marijuana despite negative consequences to the user and/or others. While this definition indicates that use must occur more than once for dependence to result in negative consequences, how much use will cause negative consequences and addiction to marijuana is highly variable depending on a person’s particular physical and psychological makeup, their environment, and other factors.
 2. In another study, heavy use of marijuana was defined as use of marijuana twice a month or more for three years or more. This study indicated that neuronal connections within the hippocampal (memory) portions of the brain, and well as in other brain structures, were weaker in persons who used marijuana at the rate defined compared to non-using study participants.
 3. There is absolutely no “risk-free” way to use a psychoactive, addictive substance like marijuana. All use, especially for adolescents, equals risk.

References

Kuhn, et. al. (2008). *Buzzed: The Straight Facts About the Most Used and Abused Drugs from Alcohol to Ecstasy*. W. W. Norton & Company, New York.

Volkow. (2013). "Marijuana's Lasting Effects on the Brain." Accessed Online: <<
<http://www.drugabuse.gov/about-nida/directors-page/messages-director/2012/09/marijuanas-lasting-effects-brain>>> 25 Oct 2013.

(Additional References and Resources Attached)