

The 2002 Petition to Reschedule Cannabis (Marijuana)

Dependence Liability: Dependency Compared to Other Drugs

Dependency compared to other drugs

Compared to other widely used drugs (alcohol, tobacco, opiates) a smaller percentage of cannabis users become dependent. Dependency is also less severe compared to many other legal and illegal drugs. The relatively low dependence liability of cannabis is widely recognized.

Withdrawal from THC has been described in animal research and humans. For example, people who smoke marijuana daily become more aggressive when they quit. Dr. Elena Kouri and colleagues at Harvard University write in the *Journal of Psychopharmacology* that they had shown objectively that when people stop smoking marijuana, there is a clear withdrawal syndrome (Kouri and Pope 2000).

The withdrawal symptoms are relatively mild. In a review of the published literature regarding cannabis withdrawal symptoms in humans, Smith (2002) stated:

"It is suggested that the studies conducted to date do not provide a strong evidence base for the drawing of any conclusions as to the existence of a cannabis withdrawal syndrome in human users, or as to the cause of symptoms reported by those abstaining from the drug. On the basis of current research, cannabis cannot be said to provide as clear a withdrawal pattern as other drugs of abuse, such as opiates. However, cannabis also highlights the need for a further defining of withdrawal, in particular the position that rebound effects occupy in this phenomenon. It is concluded that more controlled research might uncover a diagnosable withdrawal syndrome in human users and that there may be a precedent for the introduction of a cannabis withdrawal syndrome before the exact root of it is known" (Smith 2002).

Tolerance and rebound phenomena in humans have been described for cannabis. These are other indications of dependency caused by cannabis:

"Tolerance develops to the receptor-mediated effects of THC with continued usage. However, there are distinctions in their degree with different effects. Discontinuation of chronic THC use may cause rebound phenomena (transient increase in intraocular pressure, loss of appetite, etc.). Some chronic users report withdrawal symptoms after abrupt cessation. This withdrawal syndrome is characterized by irritability, agitation, sleep disorder, hyperhidrosis and loss of appetite. It is generally mild. Cannabis dependency is less determined by physical than by psychological factors. Dependency and abuse potential of therapeutically employed Δ^9 -THC is low" (Grotenhermen 2002).

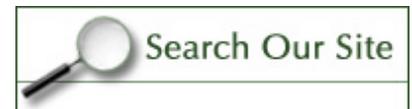
Dependency rates are reported to be lower than with many other drugs. In a German study of 1,458 current or previous cannabis users, ordered by the German Federal Health Ministry, 2-10% of those using exclusively cannabis were classified as substance dependent (Kleiber et al. 1997). If those who also used other illegal drugs were included, 8% of cannabis users were regarded as dependent, including 1% of the "occasional users," 7% of the "individual users," 10% of the "recreational users," and 28% of the "permanent users." Duration of consumption had no influence on the likelihood of the subject to quit use, an indication that the risk of dependency was independent of duration of use, and that users generally had no problems quitting.

Similar percentages were reported by Hall et al. (1999):

"A variety of estimates have been derived from U.S. studies in the late 1970s and early 1980s, which defined cannabis use and dependence in a variety of ways. These studies suggested that between 10 and 20 per cent of those who have ever used cannabis, and between 33 and 50 per cent of those who have had a history of daily cannabis use, showed symptoms of cannabis dependence (see Hall, Solowij & Lemon, 1994). A more recent and better estimate of the risk of meeting DSM-R-III criteria for cannabis dependence was obtained from data collected in the National Comorbidity Study (Anthony, Warner & Kessler, 1994). This indicated that 9 per cent of lifetime cannabis users met DSM-R-III criteria for dependence at some time in their life, compared to 32 per cent of tobacco users, 23 per cent of opiate users and 15 per cent of alcohol users" (Hall et al. 1999)

In the recent past, several studies have attempted to compare the health risks of the most common legal and illegal drugs. Two studies received special attention: a report by order of the French Health Ministry, the so-called "Roques-Report" (Roques 1998), and a study prepared for the World Health

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Organization (Hall et al. 1999). Major attention was paid to dependency/addiction caused by these drugs. The main results of these studies are summarized in Tables 1 and 2 below.

Table 1. Comparison of hazards of different drugs (modified according to Roques et al. 1998).

	Opiates	Cocaine	Alcohol	Benzodiazepines	Cannabis	Tobacco
Physical dependency	*****	**	*****	***	**	****
Psychological dependency	*****	****	*****	****	**	*****
Nerve damage	**	****	****	*	*	*
Overall toxicity (not in therapy)	****	****	****	*	*	**** (cancer)
Social hazards	*****	*****	****	**	**	*

= no effects, * = very weak effects, ** = weak effects, *** = moderate effects, **** = strong effects, ***** = very strong effects

Table 2. Comparison of adverse effects on health for heavy users of the most harmful common form of each substance (according to Hall et al. 1999).

	Marijuana	Alcohol	Tobacco	Heroin
Traffic and other accidents	*	**		*
Violence and suicide		**		
Overdose death		*		**
HIV and liver infections		*		**
Liver cirrhosis		**		
Heart disease		*	**	
Respiratory diseases	*		**	
Cancer	*	*	**	
Mental illness	*	**		
Dependency/addiction	**	**	**	**
Lasting effect on the fetus	*	**	*	*

* = less common or less well-established effect

** = important effect

Both reports concluded that heavy cannabis consumption causes less harm than heavy use of the most common other legal and illegal drugs. Special attention was paid to the question of dependency and abuse. Hall et al. (1999) concluded that all drugs under investigation can cause dependency. The main health risks to exclusive users of cannabis would be limited to daily users who consume the drug over a period of several years. These risks included the risk of a dependency syndrome, development of a chronic bronchitis, and involvement in motor vehicle accidents if the user drives under acute influence of the drug. The latter could also affect occasional users. With regard to dependency Hall et al. (1999) conclude (as quoted above):

"A variety of estimates have been derived from U.S. studies in the late 1970s and early 1980s, which defined cannabis use and dependence in a variety of ways. These studies suggested that between 10 and 20 per cent of those who have ever used cannabis, and between 33 and 50 per cent of those who have had a history of daily cannabis use, showed symptoms of cannabis dependence (see Hall, Solowij & Lemon, 1994). A more recent and better estimate of the risk of meeting DSM-R.III criteria for cannabis dependence was obtained from data collected in the National Comorbidity Study (Anthony, Warner & Kessler, 1994). This indicated that 9 per cent of lifetime cannabis users met DSM-R-III criteria for dependence at some time in their life, compared to 32 per cent of tobacco users, 23 per cent of opiate users and 15 per cent of alcohol users" (Hall et al. 1999).

Eminent addictions specialist Jack Henningfield was asked to rate the addictive qualities of popular drugs for the New York Times, and produced the following ratings according to five general indicators of abuse potential.

Comparing Addictive Qualities of Popular Drugs (Higher score indicates more serious effect)					
Drug	Dependence	Withdrawal	Tolerance	Reinforcement	Intoxication
Nicotine	6	4	5	3	2
Heroin	5	5	6	5	5
Cocaine	4	3	3	6	4

Alcohol	3	6	4	4	6
Caffeine	2	2	2	1	1
Marijuana	1	1	1	2	3

Withdrawal: Presence and severity of characteristic withdrawal symptoms.

Reinforcement: A measure of the substance's ability, in human and animal tests, to get users to take it again and again, and in preference to other substances.

Tolerance: How much of the substance is needed to satisfy increasing cravings for it, and the level of stable need that is eventually reached.

Dependence: How difficult it is for the user to quit, the relapse rate, the percentage of people who eventually become dependent, the rating users give their own need for the substance and the degree to which the substance will be used in the face of evidence that it causes harm.

Intoxication: Though not usually counted as a measure of addiction in itself, the level of intoxication is associated with addiction and increases the personal and social damage a substance may do. (Heningfeld, Hilts, 1994)

This assessment agrees with those cited above in that marijuana ranks low on all indicators of addictive potential compared to other commonly used drugs.

Adolescents are much more susceptible to marijuana dependence and to problems related to marijuana abuse than adults.

"Adolescents are dependent at a lower frequency and quantity of use than adults: the differences diverge as level of use increases. Twice as many adolescents as adults who used marijuana near-daily or daily within the last year were identified as being dependent (35% versus 18%). Frequency and quantity of use each retained a unique effect on dependence, but frequency appeared to be more important than quantity in predicting last year dependence." (Chen et al, 1997)

This higher dependence liability of adolescents is sometimes used as an argument against the medical use of cannabis. However, this argument is not used with other medicines, such as the opiates. The IOM report states that permitting the medical use of marijuana would not increase non-medical uses. The report also addresses the suggestion by opponents of medical use that approving marijuana as a medicine "sends the wrong message." The authors say there is "no convincing data to support this concern," and they note that "this question is beyond the issues normally considered for medical uses of drugs." (Joy et al. 1999).

Kandel et al. (1997) analyzed dependency rates in a sample of about 88,000 individuals. They found that nicotine was the most addictive drug. Analyses were based on three aggregated waves (1991, 1992 and 1993) of the nationally representative samples of the general population, at or above 12 years of age, interviewed in the National Household Surveys on Drug Abuse (n = 87915).

"The five major findings are that: (1) nicotine is the most addictive of the four drugs we examined; (2) among female last year users of alcohol and marijuana, adolescents are significantly more at risk for dependence than any other age group of women; (3) conditional prevalences of last year dependence on alcohol, marijuana and cocaine are higher among adolescent females than adolescent males but significantly different only for cocaine; (4) among adults, the rates of dependence are higher among males than among females for alcohol and marijuana, but lower for nicotine; and (5) among last year users, whites are more likely than any other ethnic group to be dependent on nicotine and blacks to be dependent on cocaine" (Kandel et al. 1997).

If selected samples of individuals are investigated, it is necessary to avoid any generalization of the results. Crowley et al. (1998) investigated a sample of young cannabis users (age: 13-19 years) with serious cannabis-use disorders and problems and noted:

"The prevalence of cannabis use is rising among adolescents, many of whom perceive little risk from cannabis. However, clinicians who treat adolescent substance users hear frequent reports of serious cannabis-use disorders and problems. (...)

The data indicate that for adolescents with conduct problems cannabis use is not benign, and that the drug potently reinforces cannabis-taking, producing both dependence and withdrawal. However, findings from this severely affected clinical population should not be generalized broadly to all other adolescents."

In conclusion, cannabis can cause dependency but withdrawal is milder than withdrawal from several other legal and illegal drugs, and dependency is less frequent than with most other common legal and illegal drugs.

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