

Cannabis (Marijuana)

Information for Health Professionals

Introduction

Cannabis is the general term used to describe marijuana, hashish, and hashish oil. Each of these substances is derived from the hemp plant, *Cannabis sativa*, which grows in almost any climate. Marijuana, hashish, and hashish oil all contain delta-9-tetrahydrocannabinol (THC), which is the major psychoactive chemical in cannabis products. The chemical components in cannabis are referred to as cannabinoids.

Cannabis does not fit into the usual classification of drug groups. It generally has depressant effects, yet it increases the user's heart rate like a stimulant. It can also produce hallucinations in large doses, but this is not a usual side effect.

Although cannabinoids have potential therapeutic uses (e.g., pain, anti-nausea, anti-seizure, muscle relaxation, decreased intraocular pressure for glaucoma), to date there is a lack of evidence to support using cannabinoids instead of conventional treatments. A cellular receptor that mediates the effects of cannabinoids has been identified; however, with two subtypes CB1 and CB2. It is possible that agents could be developed with more selective activation of either the CB1 or CB2 receptors. A prescription formulation of THC plus cannabidiol is marketed in Canada for the treatment of spasticity and/or neuropathic pain in multiple sclerosis and cancer pain. Prescription synthetic cannabinoids used for nausea are also available.

Cannabis products are the most widely used illegal drugs. They deserve attention because they can seriously impair users' health and functioning.

Cannabis Preparations

Marijuana ("pot", "grass", "weed", "ganja", "MJ")

Marijuana is the dried, chopped-up flowering tops and leaves (usually including seeds and stems) of the cannabis plant. It ranges in colour from grey-green to greenish-brown, and in texture from a fine powder to a coarse substance resembling tea. Hydroponic marijuana is obtained from plants that have been grown in nutrient-enriched water, rather than soil.

Marijuana is the weakest form of cannabis, and generally contains 1-5% THC. The sinsemilla growing technique, however, can yield marijuana containing 7-15% THC, and rare samples containing more than 20% THC have been reported. Levels of THC in marijuana have also risen. In the USA, THC content was less than 2% in 1980, but was found to be 8.5% in 2006.

Traditionally, marijuana is usually smoked in hand-rolled cigarettes (joints or reefers), in cigars (blunts), or in pipes. Alternatively, hookah pipes (bongs) can also be used to smoke cannabis; recently, electric vaporizers have also been used as a method of ingestion. Cannabis products can also be eaten, usually when cooked into food such as brownies or cookies. Eating cannabis is less efficient than smoking them because there is incomplete absorption from the intestine.

Hashish (“hash”)

Hashish is the dried, sticky resin of the cannabis plant. It comes in solid pieces ranging in colour from light brown to black, and in texture from dry and hard to soft and crumbly.

Hashish sold in North America generally contains 2 – 20% THC. It is usually smoked in a water pipe (bong), or cigarette with tobacco or marijuana.

Hash oil (“oil”, “honey oil”)

Obtained by purifying hashish with a solvent, hash oil is a thick, greenish-black or reddish-brown oil. The THC concentration is generally 15 – 50%, but can be more than 60%. Hash oil is usually dropped into a tobacco cigarette or rubbed into tobacco and smoked.

Drug Effects

The effect a person experiences when using drugs depends on a variety of circumstances. Factors such as how the drug is being taken, the amount of drugs consumed, expectations and mood of the user, previous history of drug use, and the setting all influence how the drug will impact the user. A user can experience the effects of cannabis even in doses of THC as low as two or three milligrams. For an occasional user, a brief, pleasurable “high” can result. A regular, heavy user, on the other hand, may smoke five or more 500 mg joints each containing 5 mg or more of THC per day. The effects of smoking are felt within a few minutes, take about one hour to fully develop, and last two to four hours; however, performance of complex tasks may be impaired for as long as 24 hours. When cannabis is eaten, the effects appear more gradually, last longer and are more difficult for the user to anticipate, as the dosage taken is harder to control once ingested.

Cannabinoids are distributed into body fat; therefore, low levels of cannabinoids can be excreted into the bloodstream and ultimately into the urine for several days even after a single dose.

Effects of Short-term Use

The most common effect of cannabis use is the “high”, a sensation similar to mild alcohol intoxication. The user experiencing a high feels calm, relaxed and talkative, and sensory perception seems enhanced. Colours may appear brighter and sound may seem more distinct. The user may misjudge the passage of time so minutes seem like hours, and appetite often increases.

The physical effects of cannabis use include rapid heartbeat, red eyes, and dry mouth and throat. The increased heart rate and effects on blood pressure can be dangerous in people who are older, or who have heart disease or high blood pressure.

Cannabis use impairs perception, judgment, balance, motor co-ordination and reaction times. It makes driving or operating machinery particularly dangerous. Driving tests have found that definite, dose-related impairment occurs with marijuana use, presumably because of impairment in attentional processes (tracking behaviour) and perceptual abilities; however, the impairment of driving behaviour by cannabis is less than predicted from laboratory testing. Drivers are aware of perceived impairment, and compensate by slowing down and driving more cautiously; therefore, drivers using cannabis tend to

underestimate their driving ability. This contrasts with drivers using alcohol, who tend to overestimate their driving performance due to alcohol-induced impairment of judgment.

Driving under the influence of cannabis has shown to increase the likelihood of a collision. Those who drive while impaired by cannabis are at almost double the risk of being involved in a seriously injuring or fatal collision. Research has shown that users who drive while under the influence of cannabis also show greater variability in maintaining a steady position in the lane, consistent distance behind cars and a steady rate of speed. Although drivers may take compensatory precautions when driving under the influence of cannabis, they experience a decreased ability to handle unexpected events. Reaction times, tracking performance and ability to divide attention are all compromised.

Some people also drink alcohol while using cannabis. Driving under the influence of both cannabis and alcohol has shown to significantly increase the risk of a collision occurring.

Memory, attention span and learning are impaired while the user is intoxicated. The more cannabis is used, the longer the effects may last. Cannabis use during the school years can cause significant problems for students.

Some cannabis users withdraw from others, or experience fearfulness and anxiety. Panic, terror, or paranoia may occur at high doses; however, those who are afflicted with psychiatric illness may be more susceptible to the effects of THC at lower doses. Very large doses can produce effects similar to those of LSD and other hallucinogens, paranoid delusions, disorientation, and severe agitation. People who have suffered head trauma, or are cognitively or developmentally delayed tend to be more prone to such reactions.

Effects of Long-term Use

Smoking cannabis damages the lungs and contributes to respiratory problems, like chronic coughing and lung infections. The levels of tar, hydrogen cyanide, and nitrosamines in cannabis are similar to those in tobacco. Heavy marijuana users have lung damage similar to the kind that precedes lung cancer in tobacco smokers. There are also reports suggesting that people who smoke both marijuana and tobacco may develop lung, neck and head cancers at an earlier age than those who smoke only tobacco. Heavy marijuana use can lead to anxiety, personality disturbances and depression. Long-term users are less able to focus attention and filter out irrelevant information. These problems are subtle, but last for many years after use has stopped.

Cannabis use has also been associated with increased levels of psychotic illnesses and experiences. Recent research has shown that cannabis use contributes to the development of schizophrenia in people who are vulnerable to it, and may cause relapses in those who have schizophrenia.

Long-term cannabis use is sometimes associated with lack of ambition and motivation, and reduced communication and social skills.

People who use drugs to avoid dealing with difficulties generally make their problems worse. When young people frequently use mood-altering substances, they often fail to learn many of the normal lessons of maturing. They may not learn how to handle their own emotions, how to take on responsibilities, and how to make thoughtful and considered decisions. The substance becomes an emotional crutch, even if it is not physically addicting. This period of time has been labeled “emerging

adulthood.” Recent research has shown that teens that are chronic cannabis users in high school and continue to use after graduating are less likely than their non-using peers to have graduated from college, be married, and have children by age 24. They are also more likely to be unemployed and have frequent, short-term relationships. Those who transition from chronic users in high school to non- or infrequent-users in early adulthood show similar development patterns as their non-user counterparts.

Pregnancy and Breastfeeding

Women who may be pregnant should avoid using marijuana, as THC is passed on to the baby via blood vessels in the placenta. Regular cannabis use during pregnancy is associated with increased risk for premature delivery and low-birth weight infants. Using cannabis during pregnancy is also associated with a variety of major birth defects, including abnormal development of the brain and heart. Children exposed to cannabis prenatally have mild withdrawal symptoms at birth and subtle behavioral and learning problems as they get older. They are also more likely to start using cannabis as well. Women who are breastfeeding should avoid using cannabis, as concentrated THC is passed on to the baby through breast milk.

Tolerance, Dependence and Withdrawal

Regular, heavy users of cannabis develop tolerance, which is a need for more drug to produce the same effect. Heavy, long-term use of cannabis can cause dependence. Users who are dependent on cannabis often feel unable to quit. They may have problems with friends and family, unstable finances, low life satisfaction and difficulties with sleeping and remembering things. The user experiences cravings for the mood-altering effects of the drug, and withdrawal occurs if drug use is abruptly stopped. Symptoms, which usually last less than a week, include troubled sleep, irritability, sweating, anxiety, upset stomach and loss of appetite. Withdrawal may increase drug-seeking behaviour and contribute to continued drug use. Heavy users often require considerable support, and possibly admission to a rehabilitation centre, to overcome their dependence on cannabis; however, unlike withdrawal from alcohol dependence, it is generally considered not to be dangerous to go through marijuana withdrawal unsupervised.

Who Uses Cannabis?

The use of cannabis in Canada is not restricted to any particular geographical region or part of society. Cannabis users are found in all age groups and at all education and income levels.

- A 2008 survey of Alberta students in grades 7 to 12 found that 16.7% had used marijuana at least once in the past 12 months, and 9.3% had used it in the previous month.
- According to a 2004 study, 32.1% of Canadian university students had used cannabis in the previous year.
- In the 2012 Canadian Alcohol and Drug Use Monitoring Survey report, 10.2% of Canadians and 11.4% of Albertans aged 15 years or older had reported using marijuana in the preceding year.
- Almost twice as many Canadian men (13.7%) than women (7.0%) reported using cannabis.
- Among Albertans receiving treatment services¹ in 2013, 49% reported using cannabis in the previous year. The majority (75%) of services used were outpatient programs.

¹ Treatment service types included: adult detox, outpatient, and residential services; youth outpatient, detox, residential and intensive services; and opioid dependency programs.

Cannabis and the Law

Cannabinoids can be detected in urine tests of casual users for one to seven days after use, and in chronic users for one to four weeks.

Under Canada's Controlled Drugs and Substances Act, the maximum penalty for first-time possession of cannabis that is less than 30 grams of marijuana or 1 gram of hashish is a \$1,000 fine and/or six months in prison, and a permanent court record. For larger amounts or a second offence, the maximum penalties are \$2,000 and/or 12 months in prison, and a permanent criminal record. Trafficking, producing, importing or exporting cannabis can result in life imprisonment.

Criminal records, including discharges, can affect job prospects in a number of professions, including government jobs requiring security checks, and positions for licensed workers such as security guards, real estate agents and veterinarians. Travel outside of Canada can also be restricted due to having a criminal record. Volunteers and youth mentor positions also frequently require criminal records checks.

The rate of cannabis-related drug crimes has been declining since 2002; however, Statistics Canada has reported that cannabis offences accounted for 62% of drug-related incidents in 2007, of which the majority (75%) were possession offences.

Medical Marijuana Legislation

Between 2001 and 2014, Canadians who had received support from their physician for the use of marijuana for medical purposes were permitted through the *Marihuana Medical Access Regulations* to a) purchase marijuana from Health Canada, b) grow marijuana for their own use, or c) assign a designate to grow marijuana on their behalf. On April 1, 2014, the program was abolished and replaced with the *Marihuana for Medical Purposes Regulations*. Under these new regulations, once a medical document has been obtained from their health care practitioner, the person can register with a licensed producer and receive a shipment not exceeding 30 times the daily dosage recommended by their health care practitioner.

Decriminalization

Bills to decriminalize marijuana were introduced in Canada in 2002 and 2004, which would have allowed law enforcement to issue fines for possession of 30 grams or less of marijuana; neither of the bills were passed. In 2013, the Canadian Association of Chiefs of Police voted in favour of ticketing for possession of small amounts of marijuana. In 2014, the federal government stated that an amendment to the legislation to allow for ticketing was under consideration.

Additional Reading

Abramovici, H. (2013). *Information for Health Care Professionals: Cannabis (marihuana, marijuana) and the cannabinoids*. Research, Synthesis, and Dissemination Division, Office of Research and Surveillance, Controlled Substances and Tobacco Directorate, Health Canada: Ottawa. Retrieved from: http://www.hc-sc.gc.ca/dhp-mps/alt_formats/pdf/marihuana/med/infoprof-eng.pdf

Adlaf, Edward M., Demers, Andrée, and Gliksman, Louis (Eds.) Canadian Campus Survey 2004. Toronto, Centre for Addiction and Mental Health. 2005

Canadian Centre on Substance Abuse. Clearing the Smoke on Cannabis: Cannabis Use and Driving [Electronic version]. Retrieved July 24, 2014, from <http://www.ccsa.ca/Resource%20Library/CCSA-Clearing-Smoke-on-Cannabis-Highlights-2013-en.pdf>

Danovitch, I., & Gorelick, D. (2012). State of the art treatments for cannabis dependence. *The Psychiatric Clinics of North America* 35(2), 309-326.

Hall, W., & Degenhardt, L. (2009). Adverse health effects of non-medical cannabis use. *The Lancet*, 374, 1383 – 1391.

Inaba, D., & Cohen, W. E. (2011). *Uppers, downers, all arounders: Physical and mental effects of psychoactive drugs*. Ashland, OR: CNS Publications.

Copyright © (2015) Alberta Health Services. This material is protected by Canadian and other international copyright laws. All rights reserved. This material may not be copied, published, distributed or reproduced in any way in whole or in part without the express written permission of Alberta Health Services (please contact David O'Brien at Community, Seniors, Addiction & Mental Health at patti.vandervelden@albertahealthservices.ca). This material is intended for general information only and is provided on an "as is", "where is" basis. Although reasonable efforts were made to confirm the accuracy of the information, Alberta Health Services does not make any representation or warranty, express, implied or statutory, as to the accuracy, reliability, completeness, applicability or fitness for a particular purpose of such information. This material is not a substitute for the advice of a qualified health professional. Alberta Health Services expressly disclaims all liability for the use of these materials, and for any claims, actions, demands or suits arising from such use.