

BEYOND THE BASICS

Cannabis

What is cannabis?

Cannabis sativa, better known as hemp, is a plant containing the drug THC (delta-9-tetrahydrocannabinol).¹ It can be grown all over the world and does especially well in temperate and tropical regions.² Cannabis is in a drug class all of its own and has unique sedative-euphoriant-psychedelic properties. It is the most commonly used illicit drug in the world today.³

Three products can be derived from cannabis:

- *Marijuana* ("pot," "weed," "grass," "dope") consists of the dried leaves and flowers of the plant. It is usually smoked in hand-rolled cigarettes ("joints" or "reefers"), water pipes ("bongs") or cigars ("blunts"). It can also be mixed in foods or brewed in tea and ingested.¹ Its THC potency varies, but over the years has increased from an average of 1% in 1974 to 6% today as a result of plant selection and cultivation practices. Some high grade samples have been found to contain 13 to 33% THC.¹
- *Hashish* ("hash"), made from the dried resin at the top of the plant, is often brown or black in colour. It is compressed into balls, cakes or sheets, and then pieces are broken off, crumbled and smoked in a pipe.¹ Its potency is from seven to 20% THC.⁴
- *"Hash oil"* is extracted from hashish and can be clear, red, black or brown. It is usually mixed with tobacco or marijuana and smoked.¹ It is the most potent form of cannabis, containing up to 70% THC.⁴

Medical Use

While marijuana is illegal in Canada under the *Controlled Drugs and Substances Act*, it can be used for medical purposes. In 2001, Health Canada implemented the Marijuana Medical Access Regulations, which allows eligible people to use dried marijuana for medicinal purposes. The Canadian government contracts growers to legally grow cannabis to supply these individuals. The regulations also allow eligible people to grow their own supply, or to designate a grower, using government supplied seeds.⁵

People must apply for authorization to possess or produce their own marijuana for medicinal purposes. These individuals must suffer from debilitating symptoms specifically outlined in the regulations, such as severe pain, muscle spasms and other symptoms from health issues that include multiple sclerosis, cancer, epilepsy, spinal cord injury, arthritis and human immunodeficiency virus (HIV)/acquired immunodeficiency syndrome (AIDS). Compassionate end-of-life care is also an allowable condition.⁶

For medicinal purposes, cannabis is marketed as Marinol® (dronabinol) and Cesamet® (nabilone). Both of these synthetic products are taken orally and used to treat nausea and vomiting resulting from chemotherapy. Marinol® is also approved to treat AIDS-related anorexia.⁶ A third cannabis-based medicine approved by Health Canada is marketed as Sativex®. It contains THC and cannabidiol extracts.⁷

Prevalence of Use

The United Nation's 2008 World Drug Report shows that cannabis use in Canada is the highest among developed nations. Some 17% of Canadians ages 15 to 64 used cannabis in 2007, compared to 12.2% of Americans and 8.2% for Britain.⁸

A 2007 Manitoba student drug survey with 4,992 respondents in grades 7 to senior 4 found that 22% of students surveyed reported use of cannabis during the past year. Of these users, about 67% had tried it for the first time before they turned 15. Over 10% of users smoke the drug daily, or more than once a day. The survey also found that in senior 3 and senior 4, males were almost twice as likely as females to purchase cannabis.⁹

The 2009 Canadian Alcohol and Drug Use Monitoring Survey (CADUMS), one of the country's most extensive surveys on addiction, surveyed 13,082 Canadians aged 15 and older. Results indicated 42.4% of respondents had used cannabis in their lifetime. Those reporting past year use fell from 14.1% in 2004 to 10.6% in 2009, which is statistically significant. Youth 15 to 24 years old are four times more likely than adults age 25 and older to have used cannabis in the past year.¹⁰

Pharmacokinetics

When cannabis is inhaled from a cigarette or pipe, the THC is rapidly absorbed by the blood in the lungs, then goes directly to the brain via the heart,

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where its effects are almost immediately felt. About 10 to 20% of the THC in a “joint” will be absorbed, but if a pipe is used, about 40 to 50% will reach the bloodstream.⁴

The level of THC in the blood peaks about 10 minutes after smoking and falls dramatically within two hours. The subjective “high” obtained from smoking cannabis lasts about three to four hours.² THC stays in the body much longer: 20 hours after smoking, about half of it is still in the blood. THC in the bloodstream is then carried to the liver, where it is changed into other compounds that may remain in the system for days. THC is also absorbed and stored in fat, where it is slowly released back into the bloodstream and eliminated. In fact, if a large dose of THC is taken, it may be detectable in the body up to three weeks later and may continue to subtly affect mental and physical functions.⁴

If cannabis is eaten, THC takes longer to get to the brain and the effects are much less intense. First, it is absorbed into the blood vessels lining the stomach and upper gastrointestinal tract. From here, it is carried to the liver, which breaks down some of the THC before distributing it to the rest of the body, including the brain. When eaten, the peak effects of the drug will not be felt for two or three hours after ingestion.² The intoxication or “high” feeling is generally much milder than when THC is smoked.¹¹

Pharmacodynamics

Scientists have found that cannabinoid receptors are widely distributed throughout the brain. Other cannabinoid receptors found outside the brain (for example, in the immune system) do not contribute to the intoxicating effects of cannabis/THC. The brain also produces compounds, such as anandamide and 2-arachidonoyl glycerol (2-AG), that activate the cannabinoid receptors. A high concentration of cannabinoid receptors is found in the hippocampus, which is the area of the brain involved in the formation of new memories. This may help to explain one of the negative effects of cannabis on users – the inability to store new memories. It is thought that THC slows down activity in the hippocampus, thus impeding the acquisition of new memories.⁴

Cannabinoid receptors are also found in the cerebellum and the basal ganglia, the regions of the brain that are used for coordination and fine-tuning of movements. The brain stem, which is involved in respiratory functioning, does not have cannabinoid receptors.⁴

Researchers have found that THC inhibits the functions of adenylate cyclase, an enzyme that has a role in passing pain messages. This may help to explain the analgesic effect of marijuana.¹¹

How Long Does Marijuana Stay in the Body?

Urine tests can detect THC metabolites 30 to 60 hours after smoking. Chronic cannabis smokers (two or three times a week) may have persistently positive urine tests for these metabolites. If a heavy user stops using, his or her urine may still test positive up to a month after quitting.

Therefore, while a positive urine test reveals cannabis use, it does not necessarily mean that the person is “high” from THC, as the use may have occurred several weeks prior to the test, and the amount of the THC metabolite left in the system may not be pharmacologically significant.²

Short-term Effects

Within a few minutes, small doses of cannabis can make users feel both relaxed and stimulated. They feel drowsy, calm and sociable, their appetite increases and their sensory perception is enhanced.³ For example, colours seem brighter, sounds seem more distinct, and time and space seem distorted. As well, short-term memory and concentration become impaired.¹²

Taken in larger quantities or at a higher potency, hallucinations are possible. Users can feel fearful, anxious and depressed or can experience panic, terror or paranoia.³ These symptoms can worsen in a person with a psychiatric disorder such as schizophrenia or bipolar disorder.¹²

Physically, cannabis can cause:¹

- impaired co-ordination and balance, attention and judgment.
- increased heart rate, from a regular rate of 70 to 80 beats per minute to as high as 100 to 130 beats per minute.
- relaxed and enlarged bronchial passages.
- expanded blood vessels in the eyes, making them appear red.
- dry mouth and throat.

Long-term Effects

A lack of motivation and interest, along with problems with memory and concentration, are long-term effects that can result from chronic use. The symptoms tend to go away when regular use stops, though there is a growing body of research that indicates there can be lasting impact on the mental function of some former users.^{11,12}

Other long-term effects of marijuana use, particularly among heavier users, concern problems with the respiratory system, such as bronchitis, asthma and chronic inflammation in lung tissue. Cancer of the respiratory tract is also higher in heavy users. This is not surprising considering that marijuana contains many toxins and cancer producing agents.¹³

Studies indicate psychiatric problems, such as depression, anxiety and schizophrenia, can be brought on by prolonged use of marijuana.¹⁴

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Permanent impairment in the ability to visually scan, and then accurately identify the features seen, may occur in heavy users who start using marijuana in their early teens. This may occur because visual scanning ability develops between the ages of 12 and 15.⁴

Other medical problems include a decrease in testosterone levels and lower sperm count for men, and an increase in testosterone levels and increased risk of infertility in women.¹

Toxic Effects

There are no known cases of death due to an overdose of cannabis. Some medical professionals go further and say a lethal overdose is virtually impossible. However, it is a fact that cannabis increases heart rate, so it is possible users who have heart problems or high blood pressure may be at risk.⁴ Those people who experience hallucinations, paranoia or panic may behave in ways that put themselves at risk for physical harm.

Tolerance and Dependence

Regular users can develop a tolerance for cannabis, so more is needed to get the same effect as experienced previously. This occurs because the cannabinoid receptors in the brain can become desensitized.²

Researchers are still trying to ascertain the extent to which cannabis users can become physically and psychologically dependent on the drug. There is evidence physical dependence can occur, but not nearly to the extent of some other addictive drugs, such as cocaine or heroin. Also, there is evidence regular users can become psychologically dependent, as shown by cravings for the drug and feelings of anxiety if it is unavailable.⁴

Withdrawal Symptoms

People attempting to break a dependency on cannabis experience mild discomfort if they suddenly stop using, but withdrawal is not life-threatening.³ Withdrawal symptoms may include a loss of appetite, upset stomach, anxiety, disturbed sleep, moodiness and irritability, and sweating. Symptoms usually last about a week.¹⁵

Illegal Production

Under Canada's Marijuana Medical Access Regulations, only government-approved growers can legally cultivate and package marijuana for sale to eligible persons for medicinal use (see *Medical Use of Cannabis* on page 1). Others can be charged under Canada's *Controlled Drugs and Substances Act* (CDSA).

Despite this, the illegal growing and trafficking of cannabis is a lucrative business. In Canada, it is estimated that as many as 50,000 illegal marijuana grow operations exist.¹⁶ About 40% of these are thought to be located in British Columbia,¹⁷ but there are reports of police raids occurring all over the country. In Winnipeg in 2008, police raided 60 "grow-ops," with affected homes ranging from

multi-million dollar new houses to older homes in established neighbourhoods.¹⁸ The damage to these homes and the health hazards to occupants are extensive (see sidebar below).

Problems in Homes Used for Marijuana Grow Operations

- voided home warranty coverage
- voided home insurance
- costs to repair damage & meet building codes
- electrocution hazards from faulty wiring
- health hazards due to mould
- fire hazards
- chemical/pesticide residue/hazards
- homes becoming temporarily uninhabitable
- detrimental effects on the well being of the neighbourhood

From: Consumer Advocacy & Support for Homeowners Society
website: <http://www.cashsociety.net/default.aspx>

Legal Issues

At this time, possession of cannabis for recreational use is illegal. Statistics Canada reported that cannabis offences, which make up about 60% of all drug offences in Canada, were down 4% in 2006.¹⁹ During that year, about 74% of cannabis offences were for possession, with the remaining 26% being for other offences, such as trafficking and cultivation.²⁰

The *Controlled Drugs and Substances Act* outlines the penalties for possession of cannabis. First-time possession of less than 30 grams of marijuana or one gram of hashish can result in a maximum penalty of a \$1,000 fine and/or six months in jail and a permanent court record. Unlawful possession of more than 30 grams of marijuana or one gram of hashish, or a second offence, can result in a maximum penalty of \$2,000 and/or a year in jail, and a permanent criminal record. Trafficking, producing, importing and exporting cannabis can result in life imprisonment.²¹

Risks & Other Harms

Cannabis increases the heart rate so users with heart disease or high blood pressure, or those taking blood pressure medications, are at increased risk. Mixing marijuana with cocaine can be very dangerous to the heart. Because cannabis can impair coordination and concentration, users who choose to drive while under its influence place themselves and others at risk.⁴

As is the case in any abuse of licit and illicit drugs, there are potential adverse consequences related to the law, a person's financial situation, family relationships, and generally putting oneself at risk by participating in unsafe behaviours while under the influence of cannabis.

Pregnancy & Lactation

Chronic heavy use of cannabis can lower sperm counts in men and increase infertility risk in women.¹

Women who use cannabis during pregnancy increase their chances of having a reduced birth weight baby. As well, some studies indicate heavy use during pregnancy may cause babies to have features similar to fetal alcohol spectrum disorder, such as increased distance between the eyes (hypertelorism).²²

THC freely crosses the placenta, so it has the potential to cause harm to the fetus. It has been found that, in mothers who use marijuana during pregnancy, the drug may cause mild fetal growth retardation. Babies born to women who smoke marijuana display mild withdrawal symptoms, including tremors and abnormal responses to stimuli.²

Research looking at the development of children born to these mothers have found that, between the ages of one and three, the children seem to be developing normally. By age four, however, developmental delays start to become apparent.²

It is known that THC can pass into breast milk, and heavy users will produce milk containing higher levels of THC. While not widely studied, possible effects on the baby could include trouble

feeding, lethargy and decreased motor development at age one, especially if the mother used cannabis soon after the baby was born.²³

Substance Use & Mental Health

- Substance use and mental health problems can often occur together. This is commonly referred to as a co-occurring disorder.
- Substance use may increase the risk of mental health problems.
- People with mental health problems are at higher risk of developing substance abuse problems:
 - Sometimes they use alcohol and other drugs in an attempt to relieve themselves from mental health symptoms.
 - For most people alcohol and other substance use only covers up the symptoms and may make them worse.

Remember: A person's experience with any drug can vary. Here are a few of the many things that may affect the experience: the amount and strength of the drug taken, the setting, a person's mood and expectations before taking the drug, gender, overall health, past experience with that drug and whether more than one drug is being used at the same time. Using alcohol and other drugs at the same time can also be dangerous.

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The Addictions Foundation of Manitoba (AFM) offers a broad range of prevention and treatment services for alcohol, other drugs and gambling. These are designed to meet the needs of all Manitobans and include harm reduction and abstinence-based programs.

For more information, contact your local AFM office or visit our website: www.afm.mb.ca.

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