



**ADULT USE
PURCHASER HANDBOOK**



Altius means "Higher"

*The Olympic motto: "Citius, Altius, Fortius",
a Latin expression meaning "Faster, Higher, Stronger"*

Change Your Altitude

Here at Altius, we take great pride in serving our adult use consumers, and providing a safe and welcoming atmosphere. Thank you for choosing our dispensary to serve your recreational needs.

Confidentiality is of the utmost importance. All information, including preferred and purchased products, as well as your other personal information is highly secured and remains confidential. For those that prefer extra privacy, we offer private consultations with one of our helpful and knowledgeable staff members so you can discuss and learn about the many ways cannabis and specific products may be able to help alleviate your specific symptoms. All cannabis customers' information including general contact information is protected. You may opt-in to our rewards and loyalty program which will allow for special discounts, offers, online orders, and allows for tracking of product purchases.

We are open Monday through Thursday from 9AM to 9PM, Friday through Saturday from 9AM to 10PM, and Sundays 10 AM to 6 PM. Please feel free to visit our website at www.AltiusDispensary.com for updated information, a list of available cannabis products, specials, forms, online ordering, to request a private purchaser consultation, and additional cannabis information.

For adult use purchasers, in order to enter our facility and purchase cannabis products from the dispensary, you should bring a photo ID showing your primary address and be over the age of 21. Identification must include a government issued ID, either state ID, Driver's License, registration certificate issued under the Military Selective Service Act, or an identification issued to a member of the Armed Services, or other valid government issued ID. IDs must be scannable by our ID verification system. Any identification that is acceptable shall be valid and unexpired and contain a photograph and date of birth.

Additionally, a passport may be utilized, but unless accompanied by a second form of identification listing the purchaser's current address, all passports will be categorized as 'out of state' residents. Acceptable secondary forms of identification to show residency include (i) a signed lease agreement that includes the applicant's name, (ii) a property deed that includes the applicant's name, (iii) school records, (iv) current and valid voter registration card, (v) an Illinois driver's license, ID card, or a Person with a Disability ID card, (vi) the most recent paycheck stub, (vii) the most recent utility bill.

Please review the attached materials. These include education materials and cover information on product types, dosages, ingestion methods, as well as cannabis user rights. We are happy to answer any and all questions regarding our selection of products and the cannabis program in Illinois. Our staff is here to serve and assist you.

Altius Dispensary - Round Lake Beach Facility

Adult Use Sales

993 E. Rollins Road

Round Lake Beach, Illinois 60073

www.AltiusDispensary.com

ADULT USE RECREATIONAL CANNABIS

Cannabis is still a federally prohibited substance, and despite state laws protecting patients, there is no protection from prosecution at the federal level.

Illinois passed the Cannabis Regulation and Tax Act (CRTA) in mid-2019, with dispensaries first opening for adult use sales on January 1st, 2020. This statewide program allows Illinois residents over the age of 21 may legally possess and purchase 30 grams of cannabis flower, five grams of cannabis concentrate

(oil), and 500 milligrams of THC in cannabis infused products (edibles). Non-residents over the age of 21 may legally possess and purchase 15 grams of cannabis flower, two and a half grams of cannabis concentrate (oil), and 250 milligrams of THC in cannabis infused products (edibles). Purchasers are limited to one purchase per day.

This information is automatically calculated by the POS software during the checkout process.

All purchases are for personal consumption only. Diversion to non-qualifying purchasers or to circumvent purchase limits will result in an immediate termination of purchasing privileges and notification to DPH and IDFPR as required by state law. All cannabis products purchased from the dispensary should be stored out of the reach of children and pets. Products should be kept in their original packaging if transporting and should remain sealed and out of reach of the driver, in a childproof and odor resistant and sealed packaging in order to comply with the CRTA. Your cannabis products must remain sealed in the exit bag as you leave the sales floor and the facility. We recommend transporting any cannabis products sealed in their exit bag and located in your car trunk if possible. It is illegal to smoke or medicate in public or in a motor vehicle.

By default, the dispensary cannot record any general identifying information regarding adult use purchasers including name, purchased items, and contact information. Our dispensary does offer a rewards program. Opting into the rewards program enhanced recordkeeping will allow purchasers access to daily deals, specials, loyalty programs, and online ordering. By opting into this rewards program, a purchaser also consents to saving necessary information for tracking of those rewards including name, contact information, and purchase history. This is also utilized in the case of any product recall for notification purposes. Purchasers may decide to not opt-in, in which case no identifying information will be retained.

By default, purchasers are not enrolled in the rewards program with enhanced recordkeeping.

IMPORTANT NOTICES

- Cannabis consumption can impair cognition and driving, is for adult use only, may be habit forming, and should not be used by pregnant or breastfeeding women or any person operating heavy machinery;
- Edible cannabis-infused products were produced in a kitchen that may also process common food allergens;
- The effects of cannabis products can vary from person to person, and it can take as long as two hours to feel the effects of some cannabis-infused products. Carefully review the portion size information and warnings contained on the product packaging before consuming.
- No minors permitted on the premises unless the minor is a minor qualifying patient under the Compassionate Use of Medical Cannabis Pilot Program Act;
- Distribution to persons under the age of 21 is prohibited;
- Transportation of cannabis or cannabis products across state lines is prohibited.

- A person may not attempt any task under the influence of cannabis that would constitute malpractice, negligence or professional misconduct.
- A person may not use in any public place – any place where a person could reasonably be expected to be seen by others. This includes restaurants, bars, movie theaters, parking lots, sidewalks, streets, stores, basically anywhere where there are people in a public place.
- A person may not use near anyone who is less than 21 years old (unless that patient has a medical authorization).
- A person may not use anywhere prohibited by Smoke-Free Illinois.
- A passenger may not use or possess on a school bus, except in the case of an approved medical marijuana case.
- A person may not use or possess in a correctional center, school, home daycare.
- A person may not use or possess in a vehicle, unless it is secured in a sealed, odor-proof, children resistant container that is kept reasonably inaccessible to the driver. This means cannabis products must be kept in a sealed, odor-proof, children resistant container, and out of the driver's reach.

THE THERAPEUTIC POTENTIAL OF CANNABIS

The most common use for cannabis in the United States is for pain control. While cannabis isn't necessarily strong enough for severe pain (for example, post-surgical pain or a broken bone), it is quite effective for the chronic pain that plagues millions of Americans, especially as they age. Part of its allure is that it is clearly safer than opiates (it is impossible to overdose on and far less addictive) and it can take the place of NSAIDs such as Advil or Aleve, if people can't take them due to problems with their kidneys or ulcers or GERD.

In particular, cannabis appears to ease the pain of multiple sclerosis, and nerve pain in general. This is an area where few other options exist, and those that do, such as Neurontin, Lyrica, or opiates are highly sedating. Patients claim that cannabis allows them to resume their previous activities without feeling completely out of it and disengaged.

Along these lines, cannabis is said to be a fantastic muscle relaxant, and people swear by its ability to lessen tremors in Parkinson's disease. Cannabis quite successfully for fibromyalgia, endometriosis, interstitial cystitis, and most other conditions where the final common pathway is chronic pain.

Cannabis is also used to manage nausea and weight loss and can be used to treat glaucoma. A highly promising area of research is its use for PTSD in veterans who are returning from combat zones.

Many veterans and their therapists report drastic improvement and clamor for more studies, and for a loosening of governmental restrictions on its study. Medical cannabis is also reported to help patients suffering from pain and wasting syndrome associated with HIV, as well as irritable bowel syndrome and Crohn's disease.

This is not intended to be an inclusive list, but rather to give a brief survey of the types of conditions for which medical cannabis can provide relief. As with all remedies, claims of effectiveness should be critically evaluated and treated with caution.

CLINICAL EVALUATION OF CANNABIS

While research in the United States has been sharply restricted by the federal prohibition on cannabis in the past, recent discoveries have increased interest among scientists in the more than 100 different cannabinoids so far identified in the cannabis plant. The International Cannabinoid Research Society (ICRS) was formally

incorporated as a scientific research organization in 1991, and since its incorporation the membership has more than tripled. The International Association for Cannabis as Medicine (IACM), founded in 2000, publishes a bi-weekly newsletter and holds a bi-annual symposium to highlight emerging clinical research concerning cannabis therapeutics. The University of California established the Center for Medical Cannabis Research (CMCR) in 2001 to conduct scientific studies to ascertain the general medical safety and efficacy of cannabis products and examine alternative forms of cannabis administration. In 2010, the CMCR issued a report on the 14 clinical studies it has conducted, most of which were FDA-approved, double-blind, placebo-controlled clinical studies that have demonstrated that cannabis can control pain, in some cases better than the available alternatives.

To date, more than 15,000 modern peer-reviewed scientific articles on the chemistry and pharmacology of cannabis and cannabinoids have been published, as well as more than 2,000 articles on the body's natural endocannabinoids. In recent years, studies and our knowledge of the endocannabinoids system and its effects have been subject of greater focus and interest, and we continue to learn more about its potential.

A 2009 review of clinical studies conducted over a 38-year period, found that “nearly all of the 33 published controlled clinical trials conducted in the United States have shown significant and measurable benefits in subjects receiving the treatment.” The review's authors note that cannabinoids have the capacity for analgesia through neuromodulation in ascending and descending pain pathways, neuroprotection, and anti-inflammatory mechanisms—all of which indicates that the cannabinoids found in cannabis have applications in managing chronic pain, muscle spasticity, cachexia, and other debilitating conditions.

THE ENDOCANNABINOID SYSTEM

Humans have used drugs derived from the opium poppy for thousands of years to lessen pain and produce euphoria. In 1973, scientists discovered the brain receptors that interact with these opiates, which include opium, morphine, and heroin. In 1975, the first of the brain's natural chemicals that bind with these receptors was identified. The similarity of this chemical, enkephalin, to morphine suggested opiate drugs work primarily by mimicking natural opiate-like molecules. These discoveries helped explain the effects of opiate drugs and opened the door to the development of powerful new therapeutic drugs that revolutionized pain management.

Similarly, humans have used the cannabis plant for thousands of years to reduce pain, control nausea, stimulate appetite, control anxiety, and produce feelings of euphoria. Since 1964 when the first cannabinoid was identified, researchers have made new discoveries that help us better understand not just why and how cannabis works so well for so many people but its full therapeutic potential.

The therapeutic benefits of cannabis are derived from the interactions of cannabinoids and the human body's own endocannabinoid system, first identified in 1988. The endocannabinoid system (ECS) is a sophisticated group of neuromodulators, their receptors, and signaling pathways involved in regulating a variety of physiological processes including movement, mood, memory, appetite, and pain.

In the little more than 20 years since researchers began developing an understanding of the ECS, two types of cannabinoid receptors, CB1 and CB2, have been identified, setting the stage for discoveries that have dramatically increased our understanding of how cannabis and its many constituent cannabinoids affect the human body.

CB1 receptors are found in the central nervous system, particularly the brain, and in other organs and tissues such as the eyes, lungs, kidneys, liver and digestive tract. In fact, the brain's receptors for cannabinoids far outnumber its opiate receptors, perhaps by as much as ten to one. The relative safety of cannabis is explained by the fact that cannabinoid receptors are virtually absent from those regions at the base of the brain that are responsible for such vital functions as breathing and heart control. CB2 receptors are primarily located in tissues associated with immune function, such as the spleen, thymus, tonsils, bone marrow, and white blood cells.

GENERAL CANNABIS INFORMATION

Cannabis is a flowering plant that has fibrous stalks used for paper, clothing, rope, and building materials while leaves, flowers, and resin used for medicinal purposes, and seeds used for food and fuel oil.

Cannabis leaves with resin and flowers are consumed in several forms: dried flower buds or various types of concentrated, loose, or pressed resin extracted from the flowers or leaves through a variety of methods. Once mature, the plant's leaves and flowers are covered with trichomes, tiny glands of resinous oil containing cannabinoids and terpenes that provide physical and psychoactive effects.

- At least 113 different types of cannabinoids have been isolated from the cannabis plant.
- Concentrations or percent of each type of cannabinoid ranges widely from plant to plant and strain to strain.
- The first identified and best-known cannabinoid is THC (delta-9- tetrahydrocannabinol). THC has the most significant psychoactive effect of the cannabinoids and is the most studied.
- The ratio of THC to other cannabinoids varies from strain to strain. While THC has been the focus of breeding and research due to its various psychoactive and therapeutic effects, non-psychoactive cannabinoids have physiologic effects that can be therapeutic and may not be accompanied by psychoactive side effects.
- Cannabidiol (CBD) relieves convulsions, inflammation, anxiety and nausea— many of the same therapeutic qualities as THC but without psychoactive effects. It is the main cannabinoid in low-THC cannabis strains, and modern breeders have been developing strains with greater CBD content for medical use.
- Cannabinol (CBN) is mildly psychoactive, decreases intraocular pressure, and seizure occurrence.
- Cannabichromene (CBC) promotes the analgesic effects (pain relief) of THC and has sedative (calming) effects.
- Cannabigerol (CBG) has sedative effects and antimicrobial properties, as well as lowers intraocular pressure.
- Tetrahydrocannabivarin (THCV) is showing promise for type 2 diabetes and related metabolic disorders.

In addition to cannabinoids, other cannabis plant molecules are biologically active. A few other molecules known to have health effects are flavonoids and terpenes or terpenoids (compounds providing the flavor and smell of the cannabis). Cannabinoids, terpenoids, and other compounds are secreted by the glandular trichomes found most densely on the floral leaves and flowers of female plants.

Effects

Different people have different experiences. One individual may feel stress release, while another feels over-stimulated, while another feels energized and on-task. There are many factors that impact the effect:

- Amount used (dosage)
- Strain of cannabis used and method of consumption
- Environment/setting
- Experience and history of cannabis use
- Biochemistry
- Mindset or mood
- Nutrition or diet

Types of Cannabis

Though cannabis is biologically classified as the single species *Cannabis Sativa*, there are at least three distinct

plant varieties: Cannabis Sativa, Cannabis Indica, and Cannabis Ruderalis, though the last is rarely used for medical or commercial production. There are also hybrids, which are crosses between sativa and indica varieties, and further poly hybrids which have established a complete and wide spectrum for cannabis characteristics and effects. Cannabis used for fiber is typically referred to as hemp and has only small amounts of the psychoactive cannabinoid THC, less than 0.3%.

All types of medical cannabis produce effects that are more similar than not, including pain and nausea control, appetite stimulation, reduced muscle spasm, improved sleep, and others. But individual strains will have differing cannabinoid and terpene content, producing noticeably different effects. Many people report finding some strains more beneficial than others. For instance, strains with more CBD tend to produce better pain and spasticity relief. As noted above, effects will also vary for an individual based on the setting in which it is used and the person's physiological state when using it. In general, sativas and indicas are frequently distinguished as follows:

Sativas

The primary effects are on thoughts and feelings. Sativas tend to produce stimulating feelings, and many prefer it for daytime use. Some noted therapeutic effects from use of Sativas:

- Stimulating/energizing
- Increased sense of well-being, focus, creativity
- Reduces depression, elevates mood
- Relieves headaches/migraines/nausea
- Increases appetite

Some noted Side-Effects from use of Sativas:

- Increased anxiety feelings
- Increased paranoia feelings

Indicas

The primary effects are on the body. Indicas tend to produce sedated feelings, and many prefer it for nighttime use. Some noted Therapeutic Effects from use of Indicas:

- Provides relaxation/reduces stress
- Relaxes muscles/spasms
- Reduces pain/inflammation/headaches/migraines
- Helps sleep
- Reduces anxiety
- Reduces nausea, stimulates appetite
- Reduces intraocular pressure
- Reduces seizure frequency/anti-convulsant

Some noted Side-Effects from use of Indicas:

- Feelings of tiredness
- “Fuzzy” thinking

Hybrids and Poly Hybrids

Strains bred from crossing two or more varieties, with typically one dominant. For example, a sativa- dominant cross may be helpful in stimulating appetite and relaxing muscle spasms. Crosses are reported to work well to combat nausea and increase appetite. These strains have the ability to provide various characteristics from each side of the spectrum, allowing for patients to fine tune strains and products that best work for their symptoms.

Cannabis Extracts and Concentrates

The dried flower or bud from the manicured, mature female plant is the most widely consumed form of

cannabis in the U.S. Elsewhere in the world, extracts or concentrates of the cannabis plant are more commonly used in the form of hash or hashish. These concentrated forms are made from cannabinoid-rich glandular trichomes, which are found in varying amounts on cannabis flowers, leaves and stalks. The flowers of a mature female plant contain the most trichomes.

Kief

Kief is a powder made from trichomes removed from the leaves and flowers of cannabis plants. Can be compressed to produce cakes of hashish, or consumed (typically smoked) in powder form in a pipe or with cannabis bud or other herbs. Kief is collected through mechanical extraction methods, physically knocking glandular trichomes off the plant and separating from plant matter. Kief, if of proper purity, can be compressed into hashish.

Hashish

Hashish (also known as hash or hashisha) is a collection of compressed or concentrated resin glands (trichomes). Hash contains the same active cannabinoids as the flower and leaves but typically in higher concentrations (in other words, hash is more potent by volume than the plant material from which it was made).

Hashish usually is a paste-like substance with varying hardness. Good quality is typically described as soft and pliable. It becomes progressively harder and less potent as it oxidizes and oil evaporates.

- THC content of hashish ranges from 15-70%.
- Often smoked with a small pipe. Can be used in food, in a hookah, vaporizer, mixed with joints of cannabis bud or aromatic herbs.
- Color varies from black to brown to red, golden, or blonde. Color typically reflects methods of harvesting, manufacturing, and storage.

Hash Oil and Extracts

Hash oil is a mix of essential oils and resins extracted from mature cannabis foliage through the use of various solvents such as hydrocarbons (butane/propane), ethanol, or pressurized carbon dioxide. The solvent is then evaporated, which leaves the remaining concentrated cannabis oil.

- Honey oil contains waxes and essential oils.
- Tends to have a high proportion of cannabinoids—a range from 30 to 90% THC content can be found.
- Can smoke with a specialty pipe for hash oil or hash, with a vaporizer, with cannabis bud in a pipe, joint, or added to food.

Edibles

Cannabis can be ingested or eaten when added to cake, cookies, dressings, and other foods. It can also be brewed into a tea or other beverage. To be effective, cannabis and its extracts or concentrates must be heated in order to convert the cannabinoid tetrahydrocannabinolic acid into active THC. Digestive processes alter the metabolism of cannabinoids and produce a different metabolite of THC in the liver.

That metabolite may produce markedly different effects or negligible ones, depending on the individual. Onset of effects are delayed and last longer due to slower absorption of the cannabinoids.

- Cannabinoids are fat-soluble, hydrophobic oils, meaning they dissolve in oils, butters, fats and alcohol, but not water.
- Processes using oil, butter, fat or alcohol can extract the cannabinoids from plant material.

Various forms of converted cannabis can be used for edible medicating. Each can be made from cannabis flowers, leaves, and concentrates such as hash. The potency of the edible will depend on the material used in making it and the amount used. Edibles made with concentrated products will be stronger than those made from leaf trim.

The recommended starting edible dose is 5mg to 10mg. Consumers new to ingesting cannabis should start with a 5mg dose and wait two hours before adding any additional doses until you can determine your tolerance level. Everyone reacts to edibles differently based on their physical body chemistry.

Purchasers should always be recommended a low dose, following the saying, “Start low and go slow.” You can always supplement your dosage, but if overmedicating, it is much more difficult to reverse the psychoactive effects.

Cannabis Cooking Oil

Cannabis Oil (cannaoil): is cooking oil infused with cannabinoids. Can be used in any recipe that includes oil and that doesn't go over 280 degrees Fahrenheit (evaporating point).

Cannabis Butter

Cannabis Butter (cannabutter) is butter infused with cannabinoids. The butter and cannabis mix is combined and heated so that the cannabinoids are extracted and infused into the fat. Cannabis butter can be used in any recipe that includes butter and doesn't go over 280 degrees Fahrenheit.

Tincture

Tinctures use ethanol alcohol (e.g. pure grain alcohol, not rubbing alcohol) or other solvents to extract the cannabinoids. You use droplet amounts, and it is absorbed through the mucous membranes in the mouth.

Spray

Sublingual sprays is another way of using a tincture. Use ethanol alcohol or other solvents to extract the cannabinoids. You use a pump to spray cannabis-alcohol solution under your tongue.

Cannabis Topicals

Cannabinoids combined with a penetrating topical cream can enter the skin and body tissues and allow for direct application to affected areas (e.g. allergic skin reactions, post-herpes neuralgia, muscle strain, inflammation, swelling, etc.).

- Cannabinoids in cannabis interact with CB1 and CB2 receptors that are found all over the body, including the skin.
- Both THC and Cannabidiol (CBD) have been found to provide pain relief and reduce inflammation.
- Topical cannabis use does not produce a psychoactive effect, which is different from eating or inhaling the medicine.

Different types of cannabis topicals include:

- Salve: cannabinoids heated into coconut oil combined with beeswax and cooled. Rub directly on skin.
- Cream: cannabinoids heated into shea butter combined with other ingredients and cooled. Rub directly on skin.
- Patches: cannabinoids are infused into band-aid like patches which slowly deliver medicating cannabinoids through the body.

Topicals may produce anti-inflammatory and analgesic or pain relief effects. Research has to date been limited to studies on allergic and post-herpes skin reactions and pain relief. Anecdotal reports on topical treatment efficacy include:

- Certain types of dermatitis (including atopic) and psoriasis
- Balm for lips, fever blisters, herpes
- Superficial wounds, cuts, acne pimples, furuncles, corns, certain nail fungus
- Rheumatism and arthritis pains (up to the 2nd degree of arthritis)
- Torticollis, back pains, muscular pains and cramps, sprains and other contusions

- Phlebitis, venous ulcerations
- Hemorrhoids
- Menstruation pains
- Cold and sore throat, bronchitis
- Asthmatic problems with breathing
- Chronical inflammation of larynx (application in the form of a Priessnitz compress)
- Migraine, head pains, tension headaches

Methods of Consumption

Adjust the Way You Use Cannabis. One of the great aspects of cannabis is that there are many ways to use the medicine effectively.

Ingest via Eating

This is one of the safest ways to consume your medication but understand that the effects from eaten cannabis may be more pronounced and onset of the effects will be delayed by an hour or more and typically last longer than inhalation. Using edible cannabis effectively will usually take some experimentation with particular product types and dosage. Digesting cannabis also metabolizes the cannabinoids somewhat differently and can produce different subjective effects, depending on the individual.

- Use small amounts of edibles and wait 2 hours before gradually increasing the dose, if needed. Take care to find and use the right dose-excessive dosage can be uncomfortable and happens most often with edibles.
- Try cannabis pills made with hash or cannabis oil.

Ingest via Tinctures/Sprays

This is one of the safest ways to consume your medication.

- Find your ideal dosage to enhance your therapeutic benefits. Start with no more than two drops and wait at least an hour before increasing the dosage, incrementally and as necessary.

Apply via Topicals

This is one of the safest ways to consume your medication and may be the best option for certain pains or ailments. Rubbing cannabis products on the skin will not result in a psychoactive effect.

Inhale via Smoking

Because the effects are noticed or felt quickly, this is a good way to get immediate relief and find the best dose for you. Research has shown that smoking cannabis does not increase your risk of lung or other cancers, but studies are limited and because it entails inhaling tars and other potential irritants, it may produce unpleasant bronchial effects such as harsh coughing.

- Smoke as little as possible. Try 1 to 3 inhalations and wait 10 to 15 minutes to find the right dosage. Increase dosage as necessary.
- Take smaller, shallower inhalations rather than deep inhales. Holding smoke in does not increase the effects; studies show that 95% of the THC is absorbed in the first few seconds of inhaling.
- If consuming with others, for health reasons, try not to share the smoking device. If sharing, quickly apply flame to the pipe mouthpiece or wipe with rubbing alcohol to kill germs.
- To avoid inhaling unnecessary chemicals, use hemp paper coated with beeswax to light your medicine rather than matches or a lighter.

Inhale via Vaporizer

This is the safest way to inhale your medicine because it heats the cannabinoid-laden oils to the point where they become airborne vapors, without bringing the other plant material to combustion, drastically reducing the amount of tars and other chemical irritants that you otherwise would inhale. Vaporizers also emit much less odor than any type of smoking.

Cannabis Dosage

Due to the wide range of types of cannabis, the various cannabis products, and individual responses to various cannabinoids, dosages may vary. At the dispensary, we advise patients to 'start low and go slow.' Generally smoking and vaporization lead to the fastest onset of effects which can occur in 1 to 30 minutes. For ingestion, effects may not be felt for up to two hours. Illinois law required edibles to be labeled with dosage information. Maintaining a record of medicine consumed, type, onset, duration, and medical benefits is a good way to maintain accurate records and determine your most beneficial dosage level.

CANNABIS SAFETY AND EFFECTS

Cannabis and its psychoactive cannabinoid, THC, have an excellent safety profile. The Drug Awareness Warning Network Annual Report, published by the Substance Abuse and Mental Health Services Administration (SAMHSA), contains a statistical compilation of all drug deaths which occur in the United States. According to this report, there has never been a death recorded from the use of cannabis.

DEA Chief Administrative Law Judge, Francis Young, in response to a petition to reschedule cannabis under federal law concluded in 1988 that, "In strict medical terms marijuana is far safer than many foods we commonly consume. Marijuana in its natural form is one of the safest therapeutically active substances known to man. By any measure of rational analysis marijuana can be safely used within the supervised routine of medical care."

More than a decade later, Institute of Medicine investigators considered the physiological risks of using cannabis and concluded that "Marijuana is not a completely benign substance. It is a powerful drug with a variety of effects. However, except for the harms associated with smoking, the adverse effects of marijuana use are within the range of effects tolerated for other medications."

Since the IOM report, research on the long term effects of smoking cannabis that studied thousands of users over decades has shown that smoking moderate amounts of cannabis (equivalent to a joint a day) has no negative effects on lung function, even in those who have consumed more than 10,000 joints. We encourage all patients to however consider the potential effects of combustion on lungs and consider one of the many alternative methods of ingestion.

Toxicity, Risk of Overdose

Cannabis has an extraordinarily high estimated lethal dose, equivalent to smoking approximately 1,500 pounds in 15 minutes, a physical impossibility. Scientists have had to estimate the LD50, or Lethal Dose for 50% of the human population, because it has never been demonstrated. This puts cannabis in a class of its own, since even relatively safe medications such as aspirin have a lethal dose. Dr. Grinspoon had this to say in a 1995 article in the Journal of the American Medical Association:

One of marijuana's greatest advantages as a medicine is its remarkable safety. It has little effect on major physiological functions. There is no known case of a lethal overdose; on the basis of animal models, the ratio of lethal to effective dose is estimated as 40,000 to 1. By comparison, the ratio is between 3 and 50 to 1 for secobarbital and between 4 and 10 to 1 for ethanol.

Marijuana is also far less addictive and far less subject to abuse than many drugs now used as muscle relaxants, hypnotics, and analgesics. The chief legitimate concern is the effect of smoking on the lungs. Cannabis smoke carries even more tars and other particulate matter than tobacco smoke. But the amount smoked is much less, especially in medical use, and once marijuana is an openly recognized medicine, solutions may be found; ultimately a technology for the inhalation of cannabinoid vapors could be developed.

That technology Dr. Grinspoon envisioned is now readily available in the form of vaporizing devices, manufactured by many companies, and available at the dispensary in a variety of forms. And, as mentioned previously, recent research on the rate of lung cancer and pulmonary diseases among even heavy cannabis smokers has revealed that they have no greater risk of lung cancer, obstructive pulmonary disease, or other adverse effects on pulmonary function than those who smoke nothing at all. However, cannabis should not be considered a harmless substance. Cannabis has a number of physiological effects, such as rapid heart rate and dilation of the blood vessels that, in limited cases, could be hazardous, particularly for those with pre-existing cardiac conditions. These adverse effects are within the range tolerated for most FDA-approved medications, and tend to dissipate with continued use, but all patients should continue to discuss with their physician.

As Dr. Grinspoon observes, “The greatest danger in medical use of marijuana is its illegality, which imposes much anxiety and expense on suffering people, forces them to bargain with illicit drug dealers, and exposes them to the threat of criminal prosecution.”

This information and more can be found through Americans for Safe Access located at www.safeaccessnow.org



If you have any questions about alcohol or other drugs, call:

Illinois Department of Human Services
Division of Alcoholism and Substance Abuse

1-866-213-0548 (toll-free Voice)

1-866-843-7344 (toll-free TTY)

If you have questions about Illinois Department of Human Services (IDHS) programs or services please call or visit your local Family Community Resource Center (FCRC). We will answer your questions. If you do not know where your FCRC is or if you are unable to go there, you may call the automated helpline 24 hours a day at:

1-800-843-6154

1-800-447-6404 (TTY)

You may speak to a representative between:
8:00 a.m. - 5:30 p.m.
Monday - Friday (except state holidays)

Visit our website at:

www.dhs.state.il.us



Programs, activities and employment opportunities in the Illinois Department of Human Services are open and accessible to any individual or group without regard to age, sex, race, sexual orientation, disability, ethnic origin or religion. The department is an equal opportunity employer and practices affirmative action and reasonable accommodation programs.

DHS 4494 (R-03-14) Drug Series - Marijuana

Printed by the Authority of the State of Illinois.

200 copies P.O.#14-1082



MARIJUANA

(Cannabis)

Facts You Should Know About



Cannabis is a green or gray mixture of dried, shredded flowers and leaves of the hemp plant. This mixture is most commonly known as marijuana, and it affects the areas in the brain responsible for movement and memory. It is the most often used illegal drug in the United States. Marijuana in its smoked form has no commonly accepted medical use. However, the active chemical in marijuana is manufactured into a pill available by prescription. This prescription drug is used to treat the nausea and vomiting that occur with certain cancer treatments and to help AIDS patients eat more to keep up their weight.

Slang Terms:

Weed	Pot
Grass	Sinsemilla
Dope Ganja	Mary Jane
Aunt Mary	Boom
Gangster	Chronic
Reefer	Kif
Hash	Skunk

Methods of Intake:

Most users roll loose marijuana into a cigarette called a joint. Marijuana can also be smoked in a water pipe called a bong, mixed into food, or brewed as tea.

THE HIGH:

Marijuana alters chemicals in the pleasure circuit of the brain. It can cause a calm euphoria as well as fits of laughter.

THE LOW:

Marijuana can trigger a number of negative effects. After an extended period of marijuana use, a user may experience withdrawal, depression, fatigue, and a lack of motivation. The user's grooming habits may become careless, and relationships with family members and friends may become hostile and begin to deteriorate.

Side Effects:

- Problems with memory and learning
- Blood shot eyes
- Dizziness
- Loss of motor coordination
- Distorted perception-sight, sound, time, touch
- Increased heart rate
- Trouble with thinking and problem solving
- Intense Anxiety
- Dry mouth
- Increased appetite
- Paranoia
- Breathing problems

Sources:

- <http://onhealth.com/conditions/conductr/substance/item%2C51697.asp> ;
- <http://www.nida.nih.gov/MarijBroch/teenpg7-8.html> ;
- <http://www.drugfreeamerica.org>

SUBSTANCE ABUSE TREATMENT FACILITY LOCATOR

If you would like to know what substance abuse treatment providers are in your community, contact one of the following helplines:

- I-800-662-HELP
- I-800-662-9832 (Espanol)
- I-800-228-0427 (TTY)

OR, visit the following website:

<http://findtreatment.samhsa.gov/TreatmentLocator>

**This information is provided as a courtesy of the
Illinois Department of Financial and Professional Regulation
for informational purposes only and not for the purpose of providing legal advice.**

Who may purchase cannabis?

Adults 21 years of age or older.

How much may a purchaser possess?

Illinois residents over the age of 21 may legally possess:

- 30 grams of cannabis flower
- 500 mg of THC in a cannabis-infused product
- 5 grams of a cannabis concentrate.

Non-residents over the age of 21 may legally possess:

- 15 grams of cannabis flower
- 250mg of THC in a cannabis-infused product
- 2.5 grams of cannabis concentrate

These totals are cumulative, meaning a person 21 years of age or older may possess a combination of cannabis flower, cannabis-infused products, and cannabis concentrates up to the limit for each category of product.

Where can I find a dispensary?

A list of licensed dispensaries can be found at <https://www.idfpr.com/profs/adultusecan.asp>.

Can I grow my own?

Only Registered Qualifying Medical Cannabis Patients may grow cannabis at home.

Can I consume cannabis at an on-site consumption lounge?

The Cannabis Regulation and Tax Act permits local governments to authorize on-site consumption lounges. The Department does not license on-site consumption lounges.

Are there rules for how I can transport cannabis in a vehicle?

While a motor vehicle is in operation, cannabis must be in a sealed, odor-proof, child-resistant container. It is a Class A misdemeanor to transport cannabis in any other type of container.

Cannabis cannot be used in a motor vehicle.

Where can I possess and consume cannabis?

- (a) This Act does not permit any person to engage in, and does not prevent the imposition of any civil, criminal, or other penalties for engaging in, any of

the following conduct:

(1) undertaking any task under the influence of cannabis when doing so would constitute negligence, professional malpractice, or professional misconduct;

(2) possessing cannabis:

(A) in a school bus, unless permitted for a qualifying patient or caregiver pursuant to the Compassionate Use of Medical Cannabis Pilot Program Act;

(B) on the grounds of any preschool or primary or secondary school, unless permitted for a qualifying patient or caregiver pursuant to the Compassionate Use of Medical Cannabis Pilot Program Act;

(C) in any correctional facility;

(D) in a vehicle not open to the public unless the cannabis is in a reasonably secured, sealed container and reasonably inaccessible while the vehicle is moving; or

(E) in a private residence that is used at any time to provide licensed child care or other similar social service care on the premises;

(3) using cannabis:

(A) in a school bus, unless permitted for a qualifying patient or caregiver pursuant to the Compassionate Use of Medical Cannabis Pilot Program Act;

(B) on the grounds of any preschool or primary or secondary school, unless permitted for a qualifying patient or caregiver pursuant to the Compassionate Use of Medical Cannabis Pilot Program Act;

(C) in any correctional facility;

(D) in any motor vehicle;

(E) in a private residence that is used at any time to provide licensed child care or other similar social service care on the premises;

(F) in any public place; or

(G) knowingly in close physical proximity to anyone under 21 years of age who is not a registered medical cannabis patient under the Compassionate Use of Medical Cannabis Pilot Program Act;

(4) smoking cannabis in any place where smoking is prohibited under the Smoke Free Illinois Act;

(5) operating, navigating, or being in actual physical control of any motor vehicle, aircraft, or motorboat while using or under the influence of cannabis in violation of Section 11-501 or 11-502.1 of the Illinois Vehicle Code;

(6) facilitating the use of cannabis by any person who is not allowed to use cannabis under this Act or the Compassionate Use of Medical Cannabis Pilot Program Act;

(7) transferring cannabis to any person contrary to this Act or the Compassionate Use of Medical Cannabis Pilot Program Act;

(8) the use of cannabis by a law enforcement officer, corrections officer, probation officer, or firefighter while on duty; or

(9) the use of cannabis by a person who has a school bus permit or a Commercial Driver's License while on duty.

As used in this Section, "public place" means any place where a person could reasonably be expected to be observed by others. "Public place" includes all parts of buildings owned in whole or in part, or leased, by the State or a unit of local government. "Public place" does not include a private residence unless the private residence is used to provide licensed child care, foster care, or other similar social service care on the premises.

(b) Nothing in this Act shall be construed to prevent the arrest or prosecution of a person for reckless driving or driving under the influence of cannabis if probable cause exists.

(c) Nothing in this Act shall prevent a private business from restricting or prohibiting the use of cannabis on its property, including areas where motor vehicles are parked.

KNOW THE FACTS

- “Pharm parties” are quickly becoming popular among adolescents. Prescription drugs are dumped in a bowl and taken by the handful, which results in dangerous drug interactions and overdoses.
- Every day, 2,500 youth 12- to 17-years of age abuse a prescription pain reliever for the first time.
- Among young adults 18- to 25-years of age, prescription drug abuse is second only to marijuana use.
- Prescription drug abuse causes the largest percentage of deaths from drug overdosing.
- Surveys show nearly half of teens believe prescription drugs are much safer than illegal street drugs. Sixty percent to 70 percent of teen prescription drug abusers say home medicine cabinets are their source.



Medicines recommended for disposal by flushing

www.fda.gov/Drugs/ResourcesForYou/Consumers/BuyingUsingMedicineSafely/EnsuringSafeUseofMedicine/SafeDisposalofMedicines/ucm186187.htm#Flushing_list

Prescription drug packages inserts

<http://dailymed.nlm.nih.gov/dailymed/about.cfm>

Information about the dangers of prescription drugs

www.talkaboutrx.org



Illinois Department of Public Health
Division of Medical Cannabis
535 W. Jefferson St.
Springfield, IL 62761

Toll-free: 855-636-3688
Phone: 217-785-4093
TTY: 800 547-0466

E-mail: DPH.MedicalCannabis@illinois.gov

Printed by Authority of the State of Illinois
P.O.#3115007 500 9/14

IOCI 15-164



State of Illinois
Illinois Department of Public Health

Mind Your Meds



BASIC MEDICATION SAFETY TIPS

SAFEGUARD YOUR MEDICATIONS

- **Store medications in a secure and dry place.** Do not leave medications in a visible place. Consider using a lock box or hiding them somewhere where they cannot be found.
- **Keep track of your medicine.** Count how many pills you have at any given time to check for missing medicine.
- **Don't share your medications under any circumstances.**
- **Keep a low profile.** Your medications are your business. Do not tell your friends about the medicines you take.



DISPOSE UNUSED MEDICATIONS

Medications play an important role in treating many conditions and diseases, but when they are no longer needed it's important to dispose of them properly to avoid harm to others. Here are ways to properly remove expired, unwanted or unused medicines from the home.

- **Medicine take-back programs.** Contact your city or county government's household trash and recycling service to see if there is a medicine take-back program.
- **Disposal in household trash.** Mix medicines (do not crush tablets or capsules) with an unpleasant substance, such as kitty litter or expired food, then place the mixture in a container, such as a sealed plastic bag, and throw it in your household trash.
- **Always remember to scratch out information on the prescription label to make it unreadable.**



Medications can be harmful and fatal when used by someone other than the person for whom the medicine was prescribed. To prevent accidental ingestion by children, pets or anyone else, some medications have specific disposal instructions to be flushed down the sink or toilet as soon as they are no longer needed, and when they cannot be disposed of through a medicine take-back program. For a detailed list of medicines that can be flushed, see the website information on the back of the brochure.

COMMONLY ABUSED PRESCRIPTION DRUGS

1. Stimulants are prescribed to treat ADHD or narcolepsy.

These medications, which include Adderall, Concerta and Ritalin, can speed up brain activity, which causes increased alertness, attention and energy.

2. Sedatives/depressants are prescribed to treat anxiety, panic attacks and sleep disorders.

These medications, which include Valium, Xanax and Ambien, slow down or “depress” the functions of the brain and central nervous system.

3. Opioids are prescribed to treat moderate-to-severe pain.

These medications, which include Vicodin, OxyContin and Percocet, can block pain messages from reaching the brain and give a feeling of euphoria.



HELP IS AVAILABLE

If you suspect a friend, roommate or loved one is abusing prescription drugs, there is help.

Substance Abuse and Mental Health Services Administration (SAMHSA)
Center for Substance Abuse Treatment (CSAT)
Contact: 240-276-2750
www.csat.samhsa.gov

SAMHSA’s National Helpline:
800-662-HELP (English and Spanish)
800-487-4889 (TDD)

Substance Abuse Treatment Facility Locator:
www.samhsa.gov/treatment



Illinois Department of Public Health
Division of Medical Cannabis
535 W. Jefferson St.
Springfield, IL 62761

Toll-free: 855-636-3688
Phone: 217-785-4093
TTY: 800 547-0466

E-mail: DPH.MedicalCannabis@illinois.gov

Printed by Authority of the State of Illinois
P.O.#3115008 500 9/14

IOCI 15-164



State of Illinois
Illinois Department of Public Health

A Slippery Slope: The Dangers of Prescription Drug Misuse and Abuse



**MISUSE OF PRESCRIPTION
DRUGS CAN KILL YOU.**

MAKING SENSE OF MISUSE AND ABUSE

Someone is **misusing** a prescription medication if they take a medication prescribed to them differently or at a higher dose than recommended by their physician, or they use someone else's medication.



Someone is **abusing** a prescription drug if they intentionally use a prescription drug to experiment, feel good or get "high." Someone who abuses prescription drugs also is likely to combine them with alcohol and/or other pills and then snort or inject them to get a quicker, more intense high.

Whatever the reason, using medications without a prescription is **illegal** and can lead to addiction, overdose and even **death**.



Many people mistakenly believe prescription medications are safe because they are FDA approved and prescribed by a doctor. However, all medications have risks and they are only safe when taken as directed by the person for whom they were prescribed. Misusing or abusing prescription medications is dangerous and can lead to long-term health problems, such as:

- High blood pressure or heart rate
- Organ damage
- Addiction
- Difficulty breathing
- Seizures
- Heart attack
- Stroke
- Death

SIGNS AND SYMPTOMS

Common reactions to misuse and abuse of prescription drugs include:

- Anxiety
- Dizziness
- Inability to concentrate
- Paranoia
- Vomiting
- Increase in body temperature
- Hostility
- Euphoria
- Sweating
- Decreased energy levels

WITHDRAWAL SYMPTOMS

When someone is addicted to prescription drugs, sudden cessation is often very dangerous. The safest way to quit is a slow decrease in the amount of drugs used under the supervision of a health professional.

Withdrawal symptoms can include:

- Seizures
- Chills
- Nausea
- Insomnia
- Drastic mood changes
- Pain
- Raised blood pressure
- Sweating
- Death



What do I need to apply for the OAPP?

Once you have visited your health care provider, your doctor will submit a physician certification to IDPH through a confidential website. Then, you will be ready to register for the Opioid Alternative Pilot Program. You may visit a licensed medical cannabis dispensary or a participating local health department for help with the on-line registration process.

You will need the following documents:

- Government-issued ID: current Illinois driver's license or state ID
- Proof of address which matches your driver's license or state ID (i.e., utility bill, voter's registration card, bank statement)
- 2" x 2" color passport photo
- Application fee – \$10 for each 90-day period. Only credit, pre-paid credit, or debit cards are accepted
- Select a dispensary

Where Can I Learn More?

About Us

The IDPH Office of Health Promotion, Medical Cannabis Registry Program implements and oversees the Medical Cannabis Pilot Program and the Opioid Alternative Pilot Program which both provide access to cannabis for medical use. Program-related materials including applications and physician education resources is available at <http://dph.illinois.gov/topics-services/prevention-wellness/medical-cannabis>.

Contact Us

Phone: 1-855-636-3688

Email: dph.medicalcannabis@illinois.gov

Web: www.dph.illinois.gov



Illinois Opioid Alternative Pilot Program

535 W. Jefferson St.
Springfield, IL 62761



State of Illinois
Illinois Department of Public Health



ILLINOIS OPIOID ALTERNATIVE
PILOT PROGRAM:

**GUIDE FOR
ELIGIBLE
PATIENTS**

Illinois Opioid Alternative Pilot Program



Data from the Illinois Department of Public Health (IDPH) indicates opioid deaths in Illinois increased 13 percent from 2016 to 2017. On August 28, 2018, Illinois enacted changes to the Compassionate Use of Medical Cannabis Pilot Program Act (“Act”). Public Act 100-1114 created the Opioid Alternative Pilot Program (OAPP). Licensed physicians must certify an individual has been prescribed or could have been prescribed an opioid based on generally accepted standards of care. The program is limited to persons 21 years old or older. Registered patients are eligible to purchase 2.5 ounces of medical cannabis every 14 days. Physician certifications are valid for 90 days but can be renewed to allow patients to continue accessing medical cannabis. A \$10 fee is required for each 90-day registration period.

Do I qualify for the Opioid Alternative Pilot Program?

If you are an Illinois resident age 21 or older and have been prescribed an opioid or have a health condition or disease for which you could be prescribed an opioid and obtain a certification from your physician, you may be eligible.

People with a CDL-driver’s license or a school bus driver permit cannot apply.

OAPP participants must be re-certified by their physician every 90 days.

Note: OAPP patients cannot have a designated caregiver to assist them with medical cannabis use. Current Medical Cannabis Pilot Program participants are not eligible to register for OAPP.

“After years of using opioids and experiencing side effects, I can’t wait to reduce my dependence on prescription drugs.” -- Robert

How much does medical cannabis cost?

Health insurance, Medicaid, and Medicare do not cover medical cannabis costs. All registered OAPP patients are responsible for the registration fee(s) and the cost of purchasing medical cannabis.



How do I apply for the Opioid Alternative Pilot Program?

Before you register for the OAPP, a doctor licensed in Illinois must complete a physician certification indicating that you have a prescription for an opioid or could be prescribed an opioid.

- You must be at least 21 years old.
- Schedule an appointment with your primary care doctor or the doctor who provides your health care to discuss whether medical cannabis is a treatment alternative to opioids.
- Ask your doctor to complete an on-line physician certification confirming your diagnosis.
- Once the physician certification has been entered on-line, you may register for the program.
- Register on-line; a \$10 registration fee is required.
- Physician certifications are valid for 90-days but can be renewed.



Designated Caregivers

Most designated caregivers are family members or persons who are close to and trusted by the registered qualifying patient. The designated caregiver can purchase medical cannabis on behalf of the patient.

Designated caregivers may also prepare medical cannabis for use by the patient – for example, breaking up the cannabis flower for vaporization, which may be difficult for a registered qualifying patient diagnosed with Multiple Sclerosis or affected by Rheumatoid Arthritis.

Designated caregivers may transport medical cannabis on behalf of the registered qualifying patient. Medical cannabis should be transported in a locked container (e.g., a locked briefcase or suitcase) in the trunk of the vehicle. Medical cannabis should never be transported in the passenger area of a vehicle.

The registered designated caregiver and qualifying patient should always carry their medical cannabis registry card.

Where Can I Learn More?

About Us

The IDPH Office of Health Promotion, Medical Cannabis Registry Program implements and oversees the patient registry program which provides qualifying patients access to cannabis for medical use. Program-related materials including applications and physician education resources is available at <http://dph.illinois.gov/topics-services/prevention-wellness/medical-cannabis>.

Contact Us

Phone: 1-855-636-3688

Email: dph.medicalcannabis@illinois.gov

Web: www.dph.illinois.gov



State of Illinois
Illinois Department of Public Health



**ILLINOIS MEDICAL CANNABIS
REGISTRY PROGRAM:
GUIDE FOR
DESIGNATED
CAREGIVERS**



Illinois Medical Cannabis Registry Program

535 W. Jefferson St.
Springfield, IL 62761



Illinois Medical Cannabis Registry Program



On August 1, 2013, Illinois enacted the Compassionate Use of Medical Cannabis Pilot Program Act (“Act”), Public Act 98-0122. The Medical Cannabis Patient Program (MCP) allows persons who are diagnosed with a qualifying debilitating medical condition to register with the Illinois Department of Public Health (IDPH) in order to obtain access to cannabis (marijuana) for medical use.

An individual diagnosed with one or more qualifying debilitating conditions is eligible to apply for a medical cannabis registry identification card. The qualifying patient must obtain a written certification from a physician specifying their debilitating condition, unless they are a veteran receiving health services at a VA facility. Veterans must submit one year of medical records from the VA facility where they receive services.

The Act is effective until July 1, 2020.

What is a designated caregiver?

In a general context, a “caregiver” is simply a person who provides assistance to someone who is seriously ill, injured, or disabled, whether mentally, physically, or both. In Illinois, a registered designated caregiver can assist the registered qualifying patient with the use and purchase of medical cannabis. A registry identification card is required to enter a medical cannabis dispensary.

To qualify for a designated caregiver identification card, an individual must:

- Be a resident of the State of Illinois at the time of application and remain a resident during participation in the program;
- Serve only one registered qualifying patient;
- Be at least 21 years of age; and
- Pay an application fee.

Persons who have been diagnosed with six months or fewer to live by a licensed physician, qualify for a free Terminal Illness Registry Card and may designate a caregiver free-of-charge.

A qualifying patient under 18 years of age may identify two designated caregivers. There is no fee for the first designated caregiver.

Caregivers are allowed to retain their CDL-driver’s license and/or school bus permit.



Role of the Designated Caregiver

The registered designated caregiver plays a very important role for the registered qualifying patient. Once the designated caregiver receives a registry card, they may enter a licensed medical cannabis dispensary and make a purchase on behalf of the patient. They may also assist the patient with the use of medical cannabis.

Ideally, the qualifying patient should select a designated caregiver at the time of application for a registry identification card; but a patient can add a caregiver later.

The registered designated caregiver **cannot**:

- Serve more than one registered patient;
- Use medical cannabis;
- Grow, possess, or distribute medical cannabis; and/or
- Purchase and possess more than the maximum amount of medical cannabis allowed for the patient during any two week period.



Information needed to apply for the MCPP

Once you have obtained your physician certification from your doctor, you are ready to apply for a medical cannabis registry card. You will need to gather the following documents:

- Government-issued ID: current Illinois driver's license or state ID
- Visit a passport photo service for a 2" x 2" color passport photo
- If applying for a reduced fee – copy of your Social Security Benefit Verification statement; Veterans will need a copy of their DD-214
- Application fee – credit or debit cards are accepted for online applications only
- Identification of a caregiver to assist with medical cannabis use, if appropriate
- Completed online application <https://medicalcannabispatients.illinois.gov>

Where Can I Learn More?

About Us

The IDPH Office of Health Promotion, Medical Cannabis Registry Program implements and oversees the patient registry program which provides qualifying patients access to cannabis for medical use. Program-related materials including applications and physician education resources is available at <http://dph.illinois.gov/topics-services/prevention-wellness/medical-cannabis>.

Contact Us

Phone: 1-855-636-3688

Email: dph.medicalcannabis@illinois.gov

Web: www.dph.illinois.gov



State of Illinois
Illinois Department of Public Health



Illinois Medical Cannabis Registry Program

535 W. Jefferson St.
Springfield, IL 62761

ILLINOIS MEDICAL CANNABIS
REGISTRY PROGRAM:

GUIDE FOR
QUALIFYING
PATIENTS

Illinois Medical Cannabis Registry Program



On August 1, 2013, Illinois enacted the Compassionate Use of Medical Cannabis Pilot Program Act (“Act”), Public Act 98-0122. The Medical Cannabis Patient Program (MCP) allows persons who are diagnosed with a qualifying debilitating medical condition to register with the Illinois Department of Public Health (IDPH) in order to obtain access to cannabis (marijuana) for medical use.

An individual diagnosed with one or more qualifying debilitating conditions is eligible to apply for a medical cannabis registry identification card. The qualifying patient must obtain a written certification from a physician specifying their debilitating condition, unless they are a veteran receiving health services at a VA facility. Veterans must submit one year of medical records from the VA facility where they receive services.

The Act is effective until July 1, 2020.

Do I qualify for a Medical Cannabis Registry Card?

If you are an Illinois resident who has been diagnosed with at least one of 41 qualifying debilitating conditions and obtain a certification from your physician, you may be eligible. The list of qualifying conditions is available at www.dph.illinois.gov.

People with a CDL-driver’s license or a school bus driver permit cannot apply.

People who have been diagnosed with six months or less to live by a licensed physician, qualify for a free Terminal Illness Registry Card.

“I am thankful for the Medical Cannabis Registry Program. I’m battling cancer and using medical cannabis helps me deal with chemotherapy and still be a mom to my children.” -- Amanda

How much does medical cannabis cost?

At this time, health insurance, Medicaid, and Medicare do not cover medical cannabis costs. All registered qualifying patients are responsible for the application fee(s) and the cost of purchasing medical cannabis.



Applying for a Medical Cannabis Registry Card

Before you apply for a registry card, a doctor licensed in Illinois must certify your debilitating condition.

- Schedule an appointment with your primary care doctor or the doctor who is treating you for your debilitating condition.
- MCP does not maintain a list of preferred physicians. Speak to all of the physicians who provide your medical care about medical cannabis.
- Print the physician certification from the MCP website and take it with you to your medical appointment and ask your doctor to complete the form, sign it, and return it to you.
- Veterans receiving care at a federal VA facility, may provide 12 months of VA medical records instead of a physician certification.

4. Check for allergens - medical cannabis-infused products may be produced in the same facility where common allergens such as tree nuts or peanuts are used.
5. Do not consume medical cannabis-infused products and alcohol together.
6. Do not drive or operate heavy machinery - edible marijuana products and some other infused products remain in your system for several hours longer than inhaled products, so you should not operate a vehicle for the rest of the day after consuming them.
7. Keep all medical-cannabis-infused products away from children and pets - store medical cannabis-infused products in a secure location. In case of accidental consumption by a child, call the Poison Center Hotline, 1-800-222-1222, immediately.
8. Label homemade medical cannabis-infused products.
9. Never offer medical cannabis-infused products to others.
10. Seek medical help if needed.

Medical Cannabis can make a person physically sick, especially in children. If you took too much medical cannabis or are experiencing an unwanted or unexpected reaction, call the Poison Center Hotline at 1-800-222-1222.



Information about medical cannabis-infused products is provided for informational purposes only and should not be used for diagnosing purposes or be substituted for medical advice.



Illinois Department of Public Health
Division of Medical Cannabis

Phone: 855-636-3688

E-mail: dph.medicalcannabis@illinois.gov

Visit <http://dph.illinois.gov/topics-services/prevention-wellness/medical-cannabis> for more information

Apply on-line

<https://medicalcannabispatients.illinois.gov/>



Medical Cannabis-Infused Products



What are medical cannabis-infused products?

These are products such as foods (or “edibles”) and tinctures that are infused with concentrated marijuana oils. Edibles are the most popular form of cannabis-infused products, and are also the most likely to result in over-consumption. Types of medical cannabis-infused products may include, but not limited to:

- edibles such as baked goods, candy or lozenges;
- teas and sodas;
- tinctures, tonics, and oils which are added to food, medicines, and liquids, or consumed directly in small drops or by placing drops under the tongue;
- topicals, which are applied directly onto the skin in the form of oils, balms, salves, lotions, sprays or ointments.

Pros

- Provide long-lasting relief
- Good alternative for people averse to inhaling
- Dosage may be more precise than with smoked products
- Topical cannabis does not produce a psychoactive effect

Cons

- Can take more time to be effective
- Dosage can vary widely depending on weight, metabolism, experience, and other factors
- Appealing to children and pets (and should be locked up to avoid accidents)
- Creates a different “high” than smoking which may be unfamiliar to patients

How will medical cannabis-infused products affect me?

The effects of medical cannabis-infused products are much different than smoking or vaporizing. Medical cannabis-infused products usually have a longer effect on the body and those effects vary from person to person and are dependent on the type and amount consumed, as well as the method in which they are consumed.

New users often experience different effects than more experienced users. Some medical cannabis patients feel no effect the first time they try it. Others — especially those who use too much their first time — may experience unpleasant feelings, such as an increased heart rate or a sense of paranoia.

What should I know before using medical cannabis-infused products?

Registered patients should use caution when using medical cannabis-infused products. It is much easier to over-consume and over-medicate with ingested products. It is important to understand there are two very significant differences between inhaling and ingesting medical cannabis:

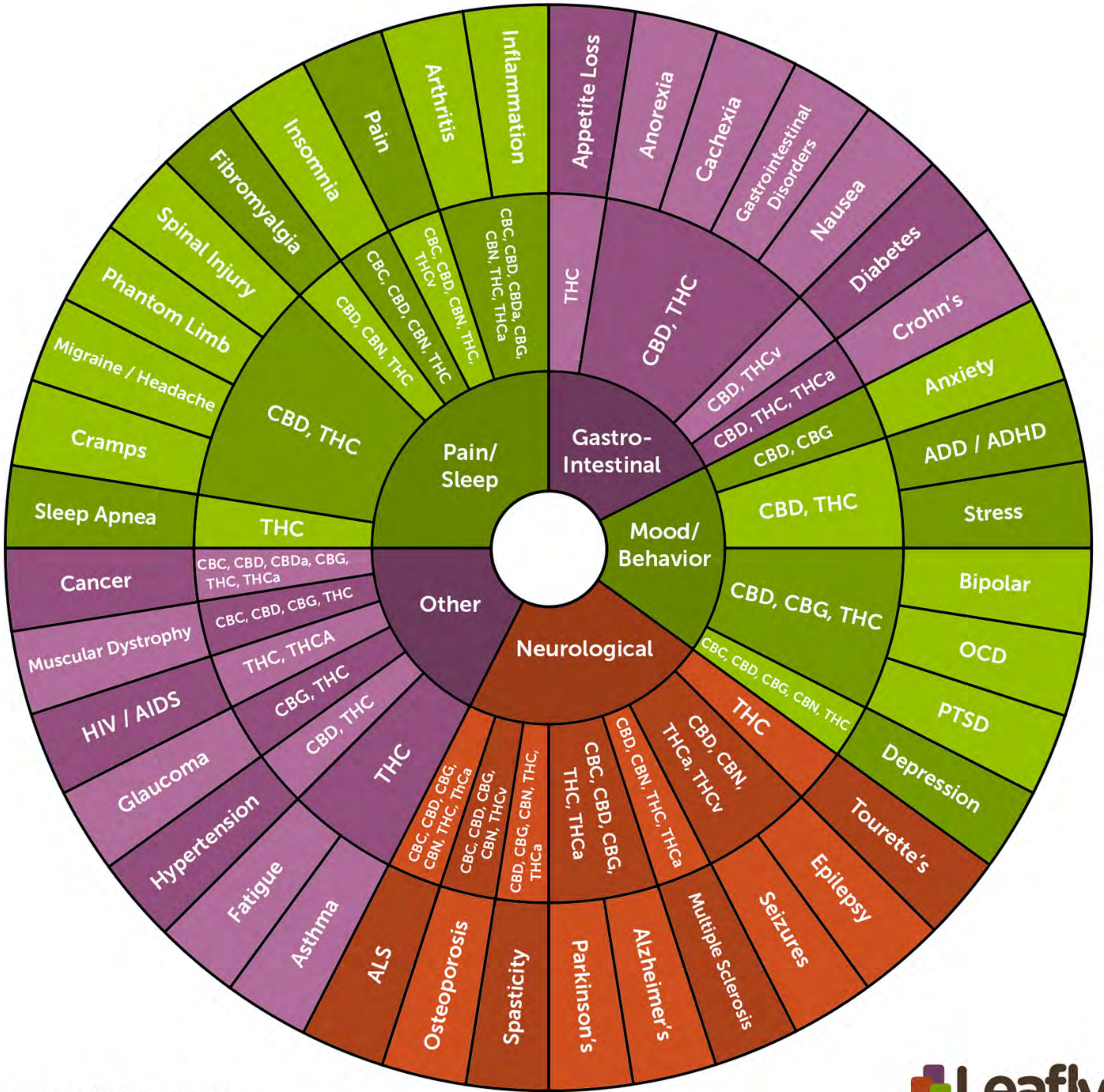
- Ingesting medical cannabis typically produces stronger and longer-lasting effects because of the way the body processes it.
- Inhaling medical cannabis results in an immediate effect, which peaks within 10 - 15 minutes, while ingesting medical cannabis can take up to two hours to take effect and can peak for a couple of hours after that.

If you choose to use medical cannabis-infused products

1. Do not eat raw cannabis - raw cannabis does not deliver therapeutic benefits and is not recommended.
2. Beware of the potency of cannabis-infused products. Start with a low dosage and go slowly. Always read the product packaging label. Some products, such as dense, rich brownies can take longer to digest, which means it will take longer to feel the effects. Products like infused drinks and tinctures are absorbed into the body much more quickly, so the effects will be felt much sooner.
3. Review the labeling of each medical cannabis-infused product.









FREQUENTLY ASKED QUESTIONS ABOUT CANNABIS

PARAMETERS FOR LEGAL USE

WHO CAN USE CANNABIS?

As of 1/1/2020, under Illinois law, adults 21 or older can legally possess and use cannabis (marijuana, weed, pot, etc.). If you are under 21 and caught in possession of cannabis you will face legal ramifications, as will the person over 21 who supplied it to you.

HOW MUCH CAN I POSSESS?

Illinois residents 21+ can possess **up to 30 grams of cannabis flower, 5 grams of cannabis concentrate such as wax or oil, or 500 milligrams of THC** within cannabis-infused products. Adults 21+ who are visiting Illinois may possess up to half of these amounts.

WHO CAN BUY AND SELL CANNABIS?

Only licensed marijuana dispensaries registered with the state may sell cannabis in Illinois. Anyone age 21+ can buy up to the legal limit from one of these dispensaries. No individual is allowed to sell marijuana.

CAN I GROW MY OWN CANNABIS?

No. You may only grow cannabis in Illinois if you are a current medical marijuana card holder. Current medical marijuana card holders may grow up to 5 plants.

WHERE CAN I USE CANNABIS?

In a private home where the public can't see you, you're not near anyone underaged, and the property owner approves. Use is also allowed in some cannabis related businesses. Marijuana use is illegal everywhere else.

CAN I DRIVE WITH CANNABIS IN THE CAR?

Yes, as long as you don't cross state lines and keep it in a sealed container and out of reach of the driver.

CAN I USE CANNABIS WHILE DRIVING?

No. It is neither legal nor safe to use cannabis while operating any motorized vehicle (this includes boats and motorcycles). Doing so can result in a DUI. Law enforcement has the right to pull over anyone and request a field sobriety test.

CAN MY EMPLOYER OR LANDLORD PROHIBIT ME FROM USING CANNABIS?

Yes. If you are on their property, you must follow their rules about cannabis use. Review your workplace cannabis policies and your lease agreement for clarification before using.

CAN I LEAVE ILLINOIS WITH CANNABIS?

No. By federal law, it is illegal to travel outside of state lines by any method of transportation (car, bus, bike, boat, foot, etc) with any amount of cannabis. All cannabis bought in Illinois must be stored and consumed in Illinois.





RESPONSIBLE USE

IS IT TRUE THAT CANNABIS IS STRONGER NOW THAN IT USED TO BE?

Yes. The way cannabis plants are grown has changed over the past few decades. Many plants now contain higher amounts of tetrahydrocannabinol (THC), the active ingredient in cannabis. The higher the THC content, the stronger the effects on your brain and behavior.

WHAT IS A NORMAL DOSE OF CANNABIS?

A single dose is considered 10mg of THC. However, every method is different and everyone reacts differently, so starting with less than 10mg can help control the effects.

IS IT SAFE TO BUY FROM A DEALER INSTEAD OF A DISPENSARY?

No. Dealers are not regulated, meaning you have no way of knowing what you're actually buying.

HOW LONG WILL IT TAKE ME TO FEEL THE EFFECTS OF CANNABIS?

It depends on individual characteristics, how frequently you use, how you use it, and how much you take.

You may feel the effects of smoking or vaping right away, but edibles can take around 30 minutes to kick in and most people don't feel the full effect of their dose until 2 hours after consumption.

IS IT POSSIBLE TO OVERDOSE ON CANNABIS?

Yes, while a fatal overdose is unlikely, it may lead to poisoning, injuries, and accidents. That's because consuming high concentrations of THC can affect your judgment, perception, and coordination.

WILL CANNABIS AFFECT MY DRIVING?

Yes. Cannabis can negatively affect the skills you need to drive safely, including reaction time, coordination, and concentration, which increases your risk of getting into a car crash.

HOW DO I STORE MY CANNABIS TO KEEP MY CHILDREN AND PETS SAFE?

Keep all marijuana products in their original child-resistant packaging and designate a hidden and locked location where your children and pets cannot reach them.

- If you think a child has ingested cannabis, call the Poison Control Center at 800-222-1222
- Dial 911 if you believe a child needs immediate medical help

IS CANNABIS DANGEROUS TO MY PETS?

Pet owners should treat cannabis, including cannabis-containing edibles, like prescription medications and keep them out of the reach of pets. **Dogs are especially attracted to edibles that contain chocolate, and chocolate can be very dangerous to them.** If you suspect your pet has ingested a cannabis-containing product, please contact your veterinarian immediately for advice on treatment.

WHAT ARE THE RISKS OF USING CANNABIS?

Cannabis smoke contains many of the same toxins and chemicals found in tobacco smoke. Smoking marijuana can lead to an increased risk of bronchitis, cough, and phlegm production. Inhaling this smoke, even secondhand, can increase your risk of developing lung problems.



ARE THERE ADDED RISKS FOR REGULAR CANNABIS USE?

Routine marijuana users are significantly more likely than nonusers to **develop long-lasting mental disorders**, including schizophrenia, anxiety, depression, and suicide.

HOW DOES CANNABIS AFFECT YOUNG ADULTS?

Using cannabis regularly in your teens and early 20s may lead to physical changes in your brain that **can permanently harm your memory, learning, and attention**. This can seriously affect your ability to reach future goals.

IS IT OK TO USE CANNABIS IF I'M PREGNANT OR BREASTFEEDING?

No. Research shows that if you use cannabis while you are pregnant or breastfeeding the growth and development of your baby's brain can be harmed. If you use while pregnant your baby is also more likely to be born with a low birth weight and have health problems.



If you have additional questions regarding nonmedical marijuana use in Illinois, please email letstalkcannabisIL@prevention.org.

Sources can be found on LetsTalkCannabisIL.com/
Sources and Public Act 101-0027:
<https://bit.ly/2EXAJSb>.



PREGUNTAS MÁS FRECUENTES SOBRE EL CANNABIS

PARÁMETROS PARA EL USO LEGAL

¿QUIÉN PUEDE USAR CANNABIS?

A partir del primero de enero del 2020, según la ley de Illinois, los adultos de 21 años o más pueden poseer y usar legalmente cannabis (marihuana, hierba, mota, etc.). Si eres menor de 21 años y te descubren en posesión de cannabis, te enfrentarás a consecuencias legales, al igual que la persona mayor de 21 años que te proporcionó la marihuana.

¿CUÁNTO PUEDO POSEER?

Los residentes de Illinois mayores de 21 años pueden poseer **hasta 30 gramos de flor de cannabis, 5 gramos de concentrado de cannabis como cera o aceite, o 500 miligramos de THC** en productos con infusión de cannabis. Los adultos mayores de 21 años que visitan Illinois pueden poseer hasta la mitad de estas cantidades.

¿QUIÉN PUEDE COMPRAR Y VENDER CANNABIS?

Solo los dispensarios de marihuana registrados con licencia en el estado pueden vender cannabis en Illinois. Cualquier persona mayor de 21 años puede comprar hasta el límite legal en uno de estos dispensarios. Ningún individuo puede vender marihuana.

¿PUEDO CULTIVAR MI PROPIO CANNABIS?

No. Solo puedes cultivar cannabis en Illinois si tienes una tarjeta de marihuana medicinal actual. Los actuales titulares de tarjetas de marihuana medicinal pueden cultivar hasta 5 plantas.

¿DÓNDE PUEDO USAR CANNABIS?

En una casa privada donde el público no puede verte, no estás cerca de nadie menor de edad y el dueño de la propiedad lo aprueba. El uso también está permitido en algunos negocios relacionados con el cannabis. El consumo de marihuana es ilegal en todos los demás lugares.

¿PUEDO CONDUCIR CON CANNABIS EN EL AUTOMÓVIL?

Sí, mientras que no cruces las fronteras estatales y lo mantengas en un contenedor sellado y fuera del alcance del conductor.

¿PUEDO USAR CANNABIS MIENTRAS CONDUZCO?

No. No es legal ni seguro usar cannabis mientras operas un vehículo motorizado (esto incluye lanchas y motocicletas). Hacerlo puede resultar en cargos por delito (DUI por sus siglas en inglés). La policía tiene el derecho de detener a cualquier persona y solicitar una prueba de sobriedad en el campo.

¿PUEDE MI EMPLEADOR O ARRENDADOR PROHIBIRME USAR CANNABIS?

Sí. Si te encuentras en su propiedad, debes seguir sus reglas sobre el consumo de cannabis. Revisa las políticas de cannabis de tu lugar de trabajo y tu contrato de arrendamiento para obtener una aclaración antes de usar.

¿PUEDO SALIR DE ILLINOIS CON CANNABIS?

No. Según la ley federal, es ilegal viajar fuera de las fronteras estatales mediante cualquier método de transporte (automóvil, autobús, bicicleta, barco, a pie, etc.) con cualquier cantidad de cannabis. Todo el cannabis comprado en Illinois debe almacenarse y consumirse en Illinois.





USO RESPONSABLE

¿ES CIERTO QUE EL CANNABIS ES MÁS FUERTE DE LO QUE ERA ANTES?

Sí. La forma en que se cultivan las plantas de cannabis ha cambiado en las últimas décadas. Muchas plantas ahora contienen mayores cantidades de tetrahidrocannabinol (THC), el ingrediente activo del cannabis. Mientras mayor sea el contenido de THC, más fuertes serán los efectos en tu cerebro y tu comportamiento.

¿CUÁL ES UNA DOSIS NORMAL DE CANNABIS?

Se considera 10 mg de THC como una sola dosis. Sin embargo, cada método es diferente y todos reaccionan de manera diferente, por lo que comenzar con menos de 10 mg puede ayudar a controlar los efectos.

¿ES SEGURO COMPRARLE A UN DEALER EN LUGAR DE UN DISPENSARIO?

No. Los dealers no están regulados, lo que significa que no tienes forma de saber lo que realmente estás comprando.

¿CUÁNTO TIEMPO TARDARÉ EN SENTIR LOS EFECTOS DEL CANNABIS?

Depende de las características individuales, la frecuencia con la que lo usas, cómo lo usas y cuánto consumes. **Es posible que sientas los efectos de fumar o vapear de inmediato, pero los comestibles pueden tardar alrededor de 30 minutos en activarse** y la mayoría de las personas no sienten el efecto completo de su dosis hasta 2 horas después del consumo.

¿ES POSIBLE TENER UNA SOBREDOSIS DE CANNABIS?

Sí, aunque es poco probable que se produzca una sobredosis mortal, puede provocar intoxicaciones, lesiones y accidentes. Eso es porque consumir altas concentraciones de THC puede afectar tu juicio, percepción y coordinación.

¿EL CANNABIS AFECTARÁ CÓMO CONDUZCO?

Sí. El cannabis puede afectar negativamente las habilidades que necesitas para conducir de manera segura, incluyendo el tiempo de reacción, la coordinación y la concentración, lo que aumenta el riesgo de sufrir un accidente automovilístico.

¿CÓMO GUARDO MI CANNABIS PARA MANTENER A MIS HIJOS Y MIS MASCOTAS SEGUROS?

Mantén todos los productos de marihuana en su empaque original a prueba de niños y designa un lugar oculto y bajo llave donde tus hijos y tus mascotas no puedan alcanzarlos.

- Si crees que un niño ha ingerido cannabis, llama al Centro de Control de Envenenamientos al 800-222-1222
- Marca el 911 si crees que un niño necesita ayuda médica inmediata

¿ES EL CANNABIS PELIGROSO PARA MIS MASCOTAS?

Los dueños de mascotas deben tratar el cannabis, incluyendo los comestibles que contienen cannabis, como medicamentos recetados y mantenerlos fuera del alcance de las mascotas. **Los perros se sienten especialmente atraídos por los comestibles que contienen chocolate, y el chocolate puede ser muy peligroso para ellos.** Si sospechas que tu mascota ha ingerido un producto que contiene cannabis, comunícate con tu veterinario de inmediato para obtener asesoramiento sobre el tratamiento.

¿CUÁLES SON LOS RIESGOS DE USAR CANNABIS?

El humo del cannabis contiene muchas de las mismas toxinas y sustancias químicas que se encuentran en el humo del tabaco. Fumar marihuana puede aumentar el riesgo de bronquitis, tos y producción de flemas. Inhalar este humo, incluso de segunda mano, puede aumentar tu riesgo de desarrollar problemas pulmonares.



¿EXISTEN RIESGOS ADICIONALES POR EL USO REGULAR DE CANNABIS?

Los consumidores habituales de marihuana tienen una probabilidad significativamente mayor que las personas que no consumen de **desarrollar trastornos mentales de larga duración**, como esquizofrenia, ansiedad, depresión y suicidio.

¿CÓMO AFECTA EL CANNABIS A LOS JÓVENES ADULTOS?

El consumo regular de cannabis en la adolescencia y antes de los 25 años puede provocar cambios físicos en el cerebro que pueden dañar **permanentemente la memoria, el aprendizaje y la atención**. Esto puede afectar seriamente tu capacidad para alcanzar metas futuras.

¿ESTÁ BIEN USAR CANNABIS SI ESTOY EMBARAZADA O LACTANDO?

No. Las investigaciones muestran que si consumes cannabis durante el embarazo o la lactancia, el crecimiento y el desarrollo del cerebro de tu bebé pueden verse perjudicados. Si lo usas durante el embarazo, es más probable que tu bebé tenga bajo peso al nacer y tenga problemas de salud.



Si tienes más preguntas sobre el uso no medicinal del cannabis en Illinois, por favor escríbenos al correo electrónico letstalkcannabisIL@prevention.org.

Las fuentes se pueden encontrar en LetsTalkCannabisIL.com/Sources and Public Act 101-0027: <https://bit.ly/2EXAJSb>.



HOW TO USE CANNABIS RESPONSIBLY

Consuming cannabis (marijuana, hashish, weed, pot, edibles, etc.) can be risky, depending on how you use and what you do afterward. If you decide to use, here is important information to keep yourself and others safe.

USE SPARINGLY

- **Cannabis is stronger than it used to be** because modern marijuana plants contain higher amounts of tetrahydrocannabinol (THC). The higher the THC content, the stronger the effects on your brain and behavior.^{1,2,3}
- The effects of high concentrations of THC are not fully understood but can **impair your judgment and coordination, and lead to poisonings, car crashes, and other injuries**. It can also increase your risk for acute psychosis.^{4,5,6,7}
- **Everyone reacts differently to cannabis**. Factors include gender, previous experience, the method in which it is used, and the strength of the cannabis.⁸ Your experience may also be affected by body weight and whether or not there is food in your system.⁹
- **Even a single dose of THC can impair your ability to drive**, bike, or do other activities - especially if you are not a regular user.^{10,11}
- While a single dose of marijuana is considered to be approximately 10 mg of THC, **it is recommended that you start with less than 10 mg and wait** to see how it affects you before using more.^{12,13}

10mg
EQUALS A SINGLE DOSE OF WEED,
REGARDLESS OF THE METHOD.



GO SLOW WITH EDIBLES

- First-time and infrequent cannabis users may want to start with 5mg of THC (approximately half a dose) to gauge their reaction before using more.
- It takes the average person 30 minutes to feel anything at all and up to 2 hours to feel the full effect of one dose,^{9,14} so be mindful and pace your use to avoid becoming too high.
- Consuming too much too fast can put you at a high risk of getting too high and experiencing marijuana toxicity.¹⁵

KEEP CHILDREN & PETS SAFE

CANNABIS USE FOR ANYONE UNDER 21

Non-medical marijuana use is illegal for anyone under 21 years of age.

CANNABIS AFFECTS CHILDREN MORE STRONGLY THAN ADULTS¹⁶

Children who have accidentally eaten marijuana products have been sick enough to need emergency medical care.¹⁷



STORE ALL CANNABIS PRODUCTS IN ITS ORIGINAL CHILD-RESISTANT PACKAGING AND KEEP IN A HIDDEN, OUT-OF-REACH PLACE

If you think a child may have ingested cannabis, call the Poison Control Center at 800-222-1222 or 911 for immediate medical assistance.

NEVER USE CANNABIS AROUND CHILDREN, ESPECIALLY WHEN YOU ARE RESPONSIBLE FOR WATCHING THEM

Secondhand cannabis smoke contains THC and other harmful chemicals found in tobacco smoke in the same quantities that can lead to a second-hand high and lung problems.^{18,19}

DO NOT CONDONE TEEN CANNABIS USE

Using cannabis regularly in your teens and early 20s can physically change your brain and permanently harm your memory, learning, and attention.^{20,21}

REGULAR USE OF MARIJUANA
IN YOUR TEENS AND EARLY 20s

**CAN PHYSICALLY
ALTER YOUR BRAIN
AND CAUSE PERMANENT HARM.**



KEEP MARIJUANA PRODUCTS AWAY FROM PETS

Pet owners should treat cannabis, including cannabis-containing edibles, like prescription medications and keep them out of the reach of pets. Dogs are especially attracted to edibles that contain chocolate, and chocolate can be very dangerous to them. If you suspect your pet has ingested a cannabis-containing product, please contact your veterinarian immediately for advice on treatment.²²



DON'T DRIVE UNDER THE INFLUENCE

- Though you may think you're more alert while using cannabis, THC can impair your judgment, coordination, and reaction time, which can lead to car crashes.^{4,23}
- It is neither legal nor safe to use cannabis while operating any motorized vehicle (this includes boats and motorcycles.)
- Driving high can result in a DUI and increase your risk of a car accident.



KNOW THE HEALTH RISKS

- Routine marijuana users are significantly more likely than nonusers to develop long-lasting mental disorders, including anxiety and depression.^{24,25}
- Smoke from cannabis contains many of the same toxins and chemicals found in tobacco smoke in the same quantities,^{26,27} and inhaling it can increase your risk of developing lung problems.^{28,29}
- 1 in 10 marijuana users develop a cannabis use disorder, meaning they can't stop using the drug even though it interferes with their social life, career achievements, and physical and mental health.
- If you are pregnant or breastfeeding, or plan to become pregnant soon, leading doctors' organizations, like the American Academy of Pediatrics, recommend that you do not use cannabis as it can be dangerous to your baby's growth and development.^{31,32}

CHEMICALS FOUND IN CANNABIS SMOKE INCLUDE AMMONIA, HYDROCYANIC ACID, AND NITROSAMINES AS WELL AS MANY OF THE COMPONENTS OF TAR INCLUDING PHENOLS, NAPHTHALENE, AND THE PROCARCINOGENIC BENZOPYRENE AND BENZANTHRACENE³⁰



BE AWARE OF VAPING & CONCENTRATES

- Researchers do not fully understand how vaping can affect your health.³³
- Vaporized and concentrated waxes and oils can contain significantly more THC, which increases the risk of marijuana poisoning.¹⁵
- According to the CDC, among 1,184 patients with a vaping related illness, 83% reported using THC-containing products.³⁴
- The processes of heating vaping devices exposes users to carcinogenic chemicals like formaldehyde and toxic metals like lead that can cause brain damage.^{35,36,37,38,39}

DON'T USE SYNTHETIC CANNABINOIDS

- Synthetic cannabinoids (K2, spice, spike) are made from another type of plant (not cannabis) that's sprayed with chemicals.^{11,40}
- They are illegal,⁴¹ extremely dangerous, and have even killed people in Illinois.⁴²
- If someone you know has used synthetic cannabinoids and needs help:
 - Call the Poison Control Center at 800-222-1222
 - If the person stops breathing, collapses, or has a seizure, call 911

For more about the health risks of using cannabis while pregnant or breastfeeding, check out [LetsTalkCannabisIL.com/New-Moms](https://www.lets-talk-cannabis.com/new-moms).

If you have additional questions regarding non-medical marijuana use in Illinois, please email letstalkcannabisIL@prevention.org.



REFERENCES

1. ElSohly, M. A., Z. Mehmedic, S. Foster, C. Gon, S. Chandra, and J. C. Church. 2016. "Changes in Cannabis Potency Over the Last 2 Decades (1995-2014): Analysis of Current Data in the United States." *Biol Psychiatry* 79 (7):613-9. doi: 10.1016/j.biopsych.2016.01.004.
2. Mehmedic, Z., S. Chandra, D. Slade, H. Denham, S. Foster, A. S. Patel, S. A. Ross, I. A. Khan, and M. A. ElSohly. 2010. "Potency trends of Delta9-THC and other cannabinoids in confiscated cannabis preparations from 1993 to 2008." *J Forensic Sci* 55 (5):1209-17. doi: 10.1111/j.1556-4029.2010.01441.x.
3. National Institute on Drug Abuse. "Marijuana." Last updated April 2017. <https://d14rmgtrwzf5a.cloudfront.net/sites/default/files/1380-marijuana.pdf>
4. Hartman, R.L., and M. A. Huestis. 2013. "Cannabis effects on driving skills." *Clin Chem* 59 (3):478-92. doi: 10.1373/clinchem.2012.194381.
5. van der Pol, P., N. Liebrechts, T. Brunt, J. van Amsterdam, R. de Graaf, D. J. Korf, W. van den Brink, and M. van Laar. 2014. "Cross-sectional and prospective relation of cannabis potency, dosing and smoking behaviour with cannabis dependence: an ecological study." *Addiction* 109 (7):1101-9. doi: 10.1111/add.12508.
6. Centers for Disease Control and Prevention. "Marijuana and Public Health: Frequently Asked Questions: What determines how marijuana affects an individual?" accessed August 14, 2017. <https://www.cdc.gov/marijuana/faqs.htm>.
7. Di Forti, M., A. Marconi, E. Carra, S. Fraietta, A. Trotta, M. Bonomo, F. Bianconi, P. Gardner-Sood, J. O'Connor, M. Russo, S. A. Stilo, T. R. Marques, V. Mondelli, P. Dazzan, C. Pariante, A. S. David, F. Gaughran, Z. Atakan, C. Iyegbe, J. Powell, C. Morgan, M. Lynskey, and R. M. Murray. 2015. "Proportion of patients in south London with first-episode psychosis attributable to use of high potency cannabis: a case-control study." *Lancet Psychiatry* 2 (3):233-8. doi: 10.1016/s2215-0366(14)00117-5.
8. Centers for Disease Control and Prevention. "Marijuana and Public Health: Frequently Asked Questions: What determines how marijuana affects an individual?" accessed August 14, 2017. <https://www.cdc.gov/marijuana/faqs.htm>.
9. Crane, T. (2017, September 17). How long do edibles take to kick in? Retrieved from <https://my420tours.com/long-edibles-take-kick/>
10. Stoll, D. B. 2014. "Marijuana use in athletics." *RI Med J* (2013) 98 (1):13.
11. National Academies of Sciences, Engineering, and Medicine. 2017. "The Health Effects of Cannabis and Cannabinoids: The Current State of Evidence and Recommendations for Research." Washington, DC: The National Academies Press. doi: 10.17226/24625.
12. California Business and Professions Code. Division 10. Cannabis. Chapter 13 Manufacturers and Cannabis Products. 26130.2. https://leginfo.ca.gov/faces/codes_displayText.xhtml?lawCode=BPC&division=10&title=&part=&chapter=13&article
13. Luna, Taryn. 2017. "Marijuana edibles: 'Start low and go slow'." *The Sacramento Bee*, August 9, 2017, Capitol Alert. <http://www.sacbee.com/news/politics-government/capitol-alert/article166152452.html>
14. Wilcox, A. (2013, December 5). Cannabis-Infused Edibles 101: What to Know About Dosing, Potency, and Labeling. Retrieved from <https://www.leafly.com/news/cannabis-101/medibles-101-everything-youve-ever-wanted-to-know-about-edibles>
15. California Department of Public Health. (2019). Safe and Responsible Use of Cannabis. Retrieved from https://www.cdph.ca.gov/Programs/DO/letstalkcannabis/CDPH%20Document%20Library/CDPH-Safe-Responsible_0901.pdf
16. Wang, G. S., G. Roosevelt, M. C. Le Lait, E. M. Martinez, B. Bucher-Bartelson, A. C. Bronstein, and K. Heard. 2014. "Association of unintentional pediatric exposures with decriminalization of marijuana in the United States." *Ann Emerg Med* 63 (6):684-9. doi: 10.1016/j.annemergmed.2014.01.017.
17. Barrus, D. G., Capogrossi, K. L., Cates, S. C., Gourdet, C. K., Peiper, N. C., Novak, S. P., ... Wiley, J. L. (2016), Tasty THC: Promises and Challenges of Cannabis Edibles. Methods Report (RTI Press). Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5260817/>



HOW TO USE CANNABIS RESPONSIBLY

18. Herrmann, E. S., E. J. Cone, J. M. Mitchell, G. E. Bigelow, C. LoDico, R. Flegel, and R. Vandrey. 2015. "Non-smoker exposure to secondhand cannabis smoke II: Effect of room ventilation on the physiological, subjective, and behavioral/cognitive effects." *Drug Alcohol Depend* 151:194-202. doi: 10.1016/j.drugalcdep.2015.03.019. F
19. Moore, C., C. Coulter, D. Uges, J. Tuyay, S. van der Linde, A. van Leeuwen, M. Garnier, and J. Orbita, Jr. 2011. "Cannabinoids in oral fluid following passive exposure to marijuana smoke." *Forensic Sci Int* 212 (1-3):227-30. doi: 0.1016/j.forsciint.2011.06.019.
20. Fusar-Poli, J. A. Crippa, S. Nogue, M. Torrens, J. Pujol, M. Farre, and R. Martin-Santos. 2013. "Structural and functional imaging studies in chronic cannabis users: a systematic review of adolescent and adult findings." *PLoS One* 8 (2):e55821. doi: 10.1371/journal.pone.0055821.
21. Broyd, S. J., H. H. van Hell, C. Beale, M. Yucel, and N. Solowij. 2016. "Acute and Chronic Effects of Cannabinoids on Human Cognition-A Systematic Review." *Biol Psychiatry* 79 (7):557-67. doi: 10.1016/j.biopsych.2015.12.002.
22. Fitzgerald, K. T., A. C. Bronstein, and K. L. Newquist. 2013. "Marijuana poisoning." *Top Companion Anim Med* 28 (1):8-12. doi: 10.1053/j.tcam.2013.03.004.
23. Rogeberg, O., and R. Elvik. 2016. "The effects of cannabis intoxication on motor vehicle collision revisited and revised." *Addiction* 111 (8):1348-59. doi: 10.1111/add.13347. F
24. National Academies of Sciences, E. and M., Health and Medicine Division, Board on Population Health and Public Health Practice, & Committee on the Health Effects of Marijuana: An Evidence Review and Research Agenda. (2017).
25. The Health Effects of Cannabis and Cannabinoids : The Current State of Evidence and Recommendations for Research. Washington, DC: National Academies Press. Retrieved from <https://www.ncbi.nlm.nih.gov/books/NBK425748/>
26. Hermann, E.S., Cone, E.J., Mitchell, J.M., Bigelow, G.E., LoDico, C., Flegel, R. Vandrey, R.2015. "Non-smoker Exposure to Seconhand Cannabis Smoke II: Effect of Room Ventilation on the Physiological, Subjective, and Behaviour/Cognitive Effects." *Drug Alcohol Depend* 151: 194-202. Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/25957157>
27. Moore, C., Coulter, C., Uges, D., Tuyay, J., van der Linde, S., van Leeuwen, A., Garnier, M., Oribita, J. Jr. 2011. "Cannabinoids in Oral Fluid Following Passive Exposure to Marijuana Smoke." *Forensic Sci Int*. 212(1-3):227-30. Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/21763088>
28. Moir, D., W. S. Rickert, G. Levasseur, Y. Larose, R. Maertens, P. White, and S. Desjardins. 2008. "A comparison of mainstream and sidestream marijuana and tobacco cigarette smoke produced under two machine smoking conditions." *Chem Res Toxicol* 21 (2):494-502. doi: 10.1021/tx700275p.
29. Tashkin, D. P. 2013. "Effects of marijuana smoking on the lung." *Ann Am Thorac Soc* 10 (3):239-47. doi: 10.1513/AnnalsATS.201212-127FR. F
30. National Institute on Drug Abuse. (2019). What Are Marijuana's Effects on Lung Health? Retrieved from <https://www.drugabuse.gov/publications/research-reports/marijuana/what-are-marijuanas-effects-lung-health>
31. American College of Obstetricians and Gynecologists. 2015. "Committee Opinion No. 637: Marijuana Use During Pregnancy and Lactation." *Obstet Gynecol* 126 (1):234-8. doi: 10.1097/01.AOG.0000467192.89321.a6.
32. American Academy of Pediatrics. 2012. "Section on Breastfeeding: Breastfeeding and the Use of Human Milk." *Pediatrics* 129 (3):e827-e841. doi: 10.1542/peds.2011-3552.
33. Budney, A. J., J. D. Sargent, and D. C. Lee. 2015. "Vaping cannabis (marijuana): parallel concerns to e-cigs?" *Addiction* 110 (11):1699-704. doi: 10.1111/add.13036.
34. Centers for Disease Control and Prevention. (2019). Outbreak of Lung Injury Associated with the Use of E-Cigarette, or Vaping, Products. Retrieved November 27, 2019, from https://www.cdc.gov/tobacco/basic_information/e-cigarettes/severe-lung-disease.html



HOW TO USE CANNABIS RESPONSIBLY

35. Maryland Medical Cannabis Commission. (2019). Potential Lead Contamination in Used Vape Cartridges. Retrieved from <https://mmcc.maryland.gov/Documents/2019-009%20Patient%20Advisory-LeadFINAL%20.pdf>
36. Fabel, D. (2017). Chronic Lead Exposure: A Non-Traumatic Brain Injury. Retrieved from <https://www.biausa.org/public-affairs/public-awareness/news/chronic-lead-exposure-a-non-traumatic-brain-injury>
37. World Health Organization. (2019). Lead poisoning and health. Retrieved from <https://www.who.int/news-room/fact-sheets/detail/lead-poisoning-and-health>
38. Giroud, C., de Cesare, M., Berthet, A., Varlet, V., Concha-Lozano, N., & Favrat, B. (2015). E-Cigarettes: A Review of New Trends in Cannabis Use. *International Journal of Environmental Research and Public Health*, 12(8). Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4555324/>
39. Simmons, A., Rouf, E., & Whittle, J. (2007). Not your typical pneumonia: a case of exogenous lipoid pneumonia. *Journal of General Internal Medicine*, 22(11), 1613-1616. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2219803/>
40. Centers for Disease Control and Prevention. "Synthetic marijuana: a dangerous drug at a cheap price." Last Modified December 12, 2013, accessed August 14, 2017. https://www.cdc.gov/nceh/hsb/synthetic_marijuana.htm
41. Senate Bill 2341, 100th General Assembly. (2018). Retrieved from <http://www.ilga.gov/legislation/billstatus.asp?DocNum=2341&GAID=14&GA=100&DocTypeID=SB&LegID=1088566&SessionID=91>
42. Illinois Department of Public Health. (2018). Fourth Death Related to Synthetic Cannabinoids. Retrieved from <http://www.dph.illinois.gov/news/fourth-death-related-synthetic-cannabinoids>



CÓMO USAR CANNABIS RESPONSABLEMENTE

Consumir cannabis (marihuana, hachis, hierba, mota, comestibles, etc.) puede tener riesgos, dependiendo de cómo lo uses y de lo que hagas después. Si decides usar cannabis, aquí encontrarás información importante para que tú y los demás estén seguros.

USAR CON MODERACIÓN

- **El cannabis de ahora es más potente de lo que solía ser** porque las plantas de marihuana modernas contienen cantidades más altas de tetrahidrocannabinol (THC). Mientras mayor sea el contenido de THC, más fuertes serán los efectos en tu cerebro y comportamiento.^{1,2,3}
- Los efectos de las altas concentraciones de THC no son totalmente comprendidos, pero pueden **afectar tu juicio y coordinación, y provocar intoxicaciones, accidentes automovilísticos y otras lesiones**. También puede aumentar tu riesgo de psicosis aguda.^{4,5,6,7}
- **Cada persona reacciona de manera diferente al cannabis**. Los factores incluyen el género, la experiencia previa, el método en el que se usa y la fuerza del cannabis.⁸ Tu experiencia también puede verse afectada por tu peso corporal y si hay o no alimentos en tu sistema.⁹
- **Incluso una sola dosis de THC puede afectar tu capacidad para conducir**, andar en bicicleta o realizar otras actividades, especialmente si no eres un usuario habitual.^{10,11}
- Mientras que se considera que una sola dosis de marihuana tiene aproximadamente 10 mg de THC, **se recomienda que comiences con menos de 10 mg** y esperes a ver cómo te afecta antes de usar más.^{12,13}

10mg

ES IGUAL A UNA SOLA DOSIS DE MARIHUANA,
INDEPENDIENTEMENTE DEL MÉTODO.



VE LENTO CON COMESTIBLES

- Los consumidores de cannabis primerizos y de poca frecuencia pueden comenzar con 5 mg de THC (aproximadamente la mitad de una dosis) para evaluar su reacción antes de consumir más.
- Le toma a una persona promedio 30 minutos sentir algo y hasta 2 horas sentir el efecto completo de una dosis,^{9,14} así que ten cuidado y controla el paso de tu uso para evitar sentir los efectos demasiado.
- Consumir de más y demasiado rápido puede ponerte en mayor riesgo de sentir los efectos demasiado y experimentar toxicidad por marihuana.¹⁵

MANTÉN SEGUROS A LOS NIÑOS Y MASCOTAS

USO DE CANNABIS PARA CUALQUIER MENOR DE 21 AÑOS

El uso de marihuana no medicinal es ilegal para cualquier persona menor de 21 años.

EL CANNABIS AFECTA A LOS NIÑOS MÁS QUE A LOS ADULTOS¹⁶

Los niños que han ingerido productos de marihuana accidentalmente han estado lo suficientemente enfermos como para necesitar atención médica de emergencia.¹⁷



GUARDA TODOS LOS PRODUCTOS DE CANNABIS EN SU EMPAQUE ORIGINAL A PRUEBA DE NIÑOS Y MANTENLOS EN UN LUGAR ESCONDIDO, FUERA DEL ALCANCE

Si crees que un niño puede haber ingerido cannabis, llama al Centro de Control de Envenenamientos al 800-222-1222 o al 911 para obtener asistencia médica inmediata.

NUNCA USES CANNABIS ALREDEDOR DE NIÑOS, ESPECIALMENTE SI ERES RESPONSABLE POR ELLOS

El humo de cannabis de segunda mano contiene THC y otras sustancias químicas nocivas que se encuentran en el humo del tabaco en las mismas cantidades que pueden provocar una euforia pasiva y problemas pulmonares.^{18,19}

NO PERMITAS EL USO DE CANNABIS EN ADOLESCENTES

El consumo regular de cannabis en la adolescencia y en los primeros 20 años puede cambiar físicamente su cerebro y dañar permanentemente la memoria, la capacidad de aprendizaje y la atención.^{20,21}

EL USO REGULAR DE MARIHUANA DURANTE TU ADOLESCENCIA Y LA PRIMERA MITAD DE TUS AÑOS 20

PUEDA ALTERAR FÍSICAMENTE TU CEREBRO

Y CAUSAR DAÑO PERMANENTE.



MANTÉN LOS PRODUCTOS DE MARIHUANA FUERA DEL ALCANCE DE LAS MASCOTAS

Los dueños de mascotas deben tratar el cannabis, incluyendo los comestibles que contienen cannabis, como medicamentos recetados y mantenerlos fuera del alcance de las mascotas. Los perros se sienten especialmente atraídos por los comestibles que contienen chocolate, y el chocolate puede ser muy peligroso para ellos. Si sospechas que tu mascota ha ingerido un producto que contiene cannabis, comunícate con tu veterinario de inmediato para obtener asesoramiento sobre el tratamiento.²²



NO CONDUZCAS BAJO LA INFLUENCIA

- Aunque puedes pensar que estás más alerta mientras consumes cannabis, el THC puede afectar tu juicio, coordinación y tiempo de reacción, lo que puede provocar accidentes automovilísticos.^{4,23}
- No es legal ni seguro consumir cannabis mientras se opera un vehículo motorizado (esto incluye lanchas y motocicletas).
- Conducir bajo la influencia puede resultar en cargos por delito (DUI por sus siglas en inglés) y aumentar tu riesgo de tener un accidente automovilístico.



CONOCE LOS RIESGOS DE SALUD

- Los consumidores habituales de marihuana tienen una probabilidad significativamente mayor que quienes no consumen de desarrollar trastornos mentales de larga duración, como ansiedad y depresión.^{24,25}
- El humo del cannabis contiene muchas de las mismas toxinas y sustancias químicas que se encuentran en el humo del tabaco en las mismas cantidades,^{26,27} e inhalarlo puede aumentar el riesgo de desarrollar problemas pulmonares.^{28,29}
- Uno de cada diez consumidores de marihuana desarrolla un trastorno por consumo de cannabis, lo que significa que no pueden dejar de consumir la droga aunque interfiera con su vida social, logros profesionales y salud física y mental.
- Si estás embarazada o lactando, o planeas quedar embarazada pronto, las principales organizaciones de médicos, como la Academia Estadounidense de Pediatría, recomiendan que no uses cannabis, ya que puede ser peligroso para el crecimiento y desarrollo de tu bebé.^{31,32}

LOS PRODUCTOS QUÍMICOS QUE SE ENCUENTRAN EN EL HUMO DE CANNABIS INCLUYEN AMONÍACO, ÁCIDO HIDROCIÁNIC Y NITROSAMINAS, ASÍ COMO MUCHOS COMPONENTES DEL ALQUITRÁN, INCLUYENDO FENOLES, NAFTALENO Y EL BENZOPIRENO Y BENZANTRACENO PROCARCINOGÉNICO³⁰



TEN PRECAUCIÓN CON LOS VAPES Y LOS CONCENTRADOS

- Los investigadores no comprenden completamente cómo el vapeo puede afectar tu salud.³³
- Las ceras y los aceites vaporizados y concentrados pueden contener significativamente más THC, lo que aumenta el riesgo de intoxicación por marihuana.¹⁵
- Según los Centros para el Control y Prevención de Enfermedades (CDC por sus siglas en inglés), entre 1,184 pacientes con una enfermedad relacionada con el vapeo, el 83% reportó haber usado productos que contienen THC.³⁴
- Los procesos de calentamiento de dispositivos de vapeo exponen a los usuarios a sustancias químicas cancerígenas como el formaldehído y a metales tóxicos como el plomo que pueden causar daño cerebral.^{35,36,37,38,39}

NO USES CANNABINOIDES SINTÉTICOS

- Los cannabinoides sintéticos (K2, spice, spike) están hechos con otro tipo de planta (no cannabis) que se rocía con productos químicos.^{11,40}
- Son ilegales,⁴¹ extremadamente peligrosos e incluso han causado la muerte de personas en Illinois.⁴²
- Si alguien que conoces ha usado cannabinoides sintéticos y necesita ayuda:
 - Llama al Centro de Control de Envenenamientos al 800-222-1222
 - Si la persona deja de respirar, se colapsa o tiene una convulsión, llama al 911

Para obtener más información sobre los riesgos de salud por consumir cannabis durante el embarazo o la lactancia, consulta [LetsTalkCannabisIL.com/New-Moms](https://www.letsstalkcannabisil.com/new-moms).

Si tienes preguntas adicionales sobre el consumo de cannabis con fines no medicinales en Illinois, envía un correo electrónico letstalkcannabisil@prevention.org.



REFERENCIAS

1. ElSohly, M. A., Z. Mehmedic, S. Foster, C. Gon, S. Chandra, and J. C. Church. 2016. "Changes in Cannabis Potency Over the Last 2 Decades (1995-2014): Analysis of Current Data in the United States." *Biol Psychiatry* 79 (7):613-9. doi: 10.1016/j.biopsych.2016.01.004.
2. Mehmedic, Z., S. Chandra, D. Slade, H. Denham, S. Foster, A. S. Patel, S. A. Ross, I. A. Khan, and M. A. ElSohly. 2010. "Potency trends of Delta9-THC and other cannabinoids in confiscated cannabis preparations from 1993 to 2008." *J Forensic Sci* 55 (5):1209-17. doi: 10.1111/j.1556-4029.2010.01441.x.
3. National Institute on Drug Abuse. "Marijuana." Last updated April 2017. <https://d14rmgtrwzf5a.cloudfront.net/sites/default/files/1380-marijuana.pdf>
4. Hartman, R.L., and M. A. Huestis. 2013. "Cannabis effects on driving skills." *Clin Chem* 59 (3):478-92. doi: 10.1373/clinchem.2012.194381.
5. van der Pol, P., N. Liebrechts, T. Brunt, J. van Amsterdam, R. de Graaf, D. J. Korf, W. van den Brink, and M. van Laar. 2014. "Cross-sectional and prospective relation of cannabis potency, dosing and smoking behaviour with cannabis dependence: an ecological study." *Addiction* 109 (7):1101-9. doi: 10.1111/add.12508.
6. Centers for Disease Control and Prevention. "Marijuana and Public Health: Frequently Asked Questions: What determines how marijuana affects an individual?" accessed August 14, 2017. <https://www.cdc.gov/marijuana/faqs.htm>.
7. Di Forti, M., A. Marconi, E. Carra, S. Fraietta, A. Trotta, M. Bonomo, F. Bianconi, P. Gardner-Sood, J. O'Connor, M. Russo, S. A. Stilo, T. R. Marques, V. Mondelli, P. Dazzan, C. Pariante, A. S. David, F. Gaughran, Z. Atakan, C. Iyegbe, J. Powell, C. Morgan, M. Lynskey, and R. M. Murray. 2015. "Proportion of patients in south London with first-episode psychosis attributable to use of high potency cannabis: a case-control study." *Lancet Psychiatry* 2 (3):233-8. doi: 10.1016/s2215-0366(14)00117-5.
8. Centers for Disease Control and Prevention. "Marijuana and Public Health: Frequently Asked Questions: What determines how marijuana affects an individual?" accessed August 14, 2017. <https://www.cdc.gov/marijuana/faqs.htm>.
9. Crane, T. (2017, September 17). How long do edibles take to kick in? Retrieved from <https://my420tours.com/long-edibles-take-kick/>
10. Stoll, D. B. 2014. "Marijuana use in athletics." *RI Med J* (2013) 98 (1):13.
11. National Academies of Sciences, Engineering, and Medicine. 2017. "The Health Effects of Cannabis and Cannabinoids: The Current State of Evidence and Recommendations for Research." Washington, DC: The National Academies Press. doi: 10.17226/24625.
12. California Business and Professions Code. Division 10. Cannabis. Chapter 13 Manufacturers and Cannabis Products. 26130.2. https://leginfo.ca.gov/faces/codes_displayText.xhtml?lawCode=BPC&division=10&title=&part=&chapter=13&article
13. Luna, Taryn. 2017. "Marijuana edibles: 'Start low and go slow'." *The Sacramento Bee*, August 9, 2017, Capitol Alert. <http://www.sacbee.com/news/politics-government/capitol-alert/article166152452.html>
14. Wilcox, A. (2013, December 5). Cannabis-Infused Edibles 101: What to Know About Dosing, Potency, and Labeling. Retrieved from <https://www.leafly.com/news/cannabis-101/medibles-101-everything-youve-ever-wanted-to-know-about-edibles>
15. California Department of Public Health. (2019). Safe and Responsible Use of Cannabis. Retrieved from https://www.cdph.ca.gov/Programs/DO/letstalkcannabis/CDPH%20Document%20Library/CDPH-Safe-Responsible_0901.pdf
16. Wang, G. S., G. Roosevelt, M. C. Le Lait, E. M. Martinez, B. Bucher-Bartelson, A. C. Bronstein, and K. Heard. 2014. "Association of unintentional pediatric exposures with decriminalization of marijuana in the United States." *Ann Emerg Med* 63 (6):684-9. doi: 10.1016/j.annemergmed.2014.01.017.
17. Barrus, D. G., Capogrossi, K. L., Cates, S. C., Gourdet, C. K., Peiper, N. C., Novak, S. P., ... Wiley, J. L. (2016), Tasty THC: Promises and Challenges of Cannabis Edibles. Methods Report (RTI Press). Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5260817/>



CÓMO USAR CANNABIS RESPONSABLEMENTE

18. Herrmann, E. S., E. J. Cone, J. M. Mitchell, G. E. Bigelow, C. LoDico, R. Flegel, and R. Vandrey. 2015. "Non-smoker exposure to secondhand cannabis smoke II: Effect of room ventilation on the physiological, subjective, and behavioral/cognitive effects." *Drug Alcohol Depend* 151:194-202. doi: 10.1016/j.drugalcdep.2015.03.019. F
19. Moore, C., C. Coulter, D. Uges, J. Tuyay, S. van der Linde, A. van Leeuwen, M. Garnier, and J. Orbita, Jr. 2011. "Cannabinoids in oral fluid following passive exposure to marijuana smoke." *Forensic Sci Int* 212 (1-3):227-30. doi: 0.1016/j.forsciint.2011.06.019.
20. Fusar-Poli, J. A. Crippa, S. Nogue, M. Torrens, J. Pujol, M. Farre, and R. Martin-Santos. 2013. "Structural and functional imaging studies in chronic cannabis users: a systematic review of adolescent and adult findings." *PLoS One* 8 (2):e55821. doi: 10.1371/journal.pone.0055821.
21. Broyd, S. J., H. H. van Hell, C. Beale, M. Yucel, and N. Solowij. 2016. "Acute and Chronic Effects of Cannabinoids on Human Cognition-A Systematic Review." *Biol Psychiatry* 79 (7):557-67. doi: 10.1016/j.biopsych.2015.12.002.
22. Fitzgerald, K. T., A. C. Bronstein, and K. L. Newquist. 2013. "Marijuana poisoning." *Top Companion Anim Med* 28 (1):8-12. doi: 10.1053/j.tcam.2013.03.004.
23. Rogeberg, O., and R. Elvik. 2016. "The effects of cannabis intoxication on motor vehicle collision revisited and revised." *Addiction* 111 (8):1348-59. doi: 10.1111/add.13347. F
24. National Academies of Sciences, E. and M., Health and Medicine Division, Board on Population Health and Public Health Practice, & Committee on the Health Effects of Marijuana: An Evidence Review and Research Agenda. (2017).
25. The Health Effects of Cannabis and Cannabinoids : The Current State of Evidence and Recommendations for Research. Washington, DC: National Academies Press. Retrieved from <https://www.ncbi.nlm.nih.gov/books/NBK425748/>
26. Hermann, E.S., Cone, E.J., Mitchell, J.M., Bigelow, G.E., LoDico, C., Flegel, R. Vandrey, R.2015. "Non-smoker Exposure to Seconhand Cannabis Smoke II: Effect of Room Ventilation on the Physiological, Subjective, and Behaviour/Cognitive Effects." *Drug Alcohol Depend* 151: 194-202. Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/25957157>
27. Moore, C., Coulter, C., Uges, D., Tuyay, J., van der Linde, S., van Leeuwen, A., Garnier, M., Oribita, J. Jr. 2011. "Cannabinoids in Oral Fluid Following Passive Exposure to Marijuana Smoke." *Forensic Sci Int*. 212(1-3):227-30. Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/21763088>
28. Moir, D., W. S. Rickert, G. Levasseur, Y. Larose, R. Maertens, P. White, and S. Desjardins. 2008. "A comparison of mainstream and sidestream marijuana and tobacco cigarette smoke produced under two machine smoking conditions." *Chem Res Toxicol* 21 (2):494-502. doi: 10.1021/tx700275p.
29. Tashkin, D. P. 2013. "Effects of marijuana smoking on the lung." *Ann Am Thorac Soc* 10 (3):239-47. doi: 10.1513/AnnalsATS.201212-127FR. F
30. National Institute on Drug Abuse. (2019). What Are Marijuana's Effects on Lung Health? Retrieved from <https://www.drugabuse.gov/publications/research-reports/marijuana/what-are-marijuanas-effects-lung-health>
31. American College of Obstetricians and Gynecologists. 2015. "Committee Opinion No. 637: Marijuana Use During Pregnancy and Lactation." *Obstet Gynecol* 126 (1):234-8. doi: 10.1097/01.AOG.0000467192.89321.a6.
32. American Academy of Pediatrics. 2012. "Section on Breastfeeding: Breastfeeding and the Use of Human Milk." *Pediatrics* 129 (3):e827-e841. doi: 10.1542/peds.2011-3552.
33. Budney, A. J., J. D. Sargent, and D. C. Lee. 2015. "Vaping cannabis (marijuana): parallel concerns to e-cigs?" *Addiction* 110 (11):1699-704. doi: 10.1111/add.13036.
34. Centers for Disease Control and Prevention. (2019). Outbreak of Lung Injury Associated with the Use of E-Cigarette, or Vaping, Products. Retrieved November 27, 2019, from https://www.cdc.gov/tobacco/basic_information/e-cigarettes/severe-lung-disease.html



CÓMO USAR CANNABIS RESPONSABLEMENTE

35. Maryland Medical Cannabis Commission. (2019). Potential Lead Contamination in Used Vape Cartridges. Retrieved from <https://mmcc.maryland.gov/Documents/2019-009%20Patient%20Advisory-LeadFINAL%20.pdf>
36. Fabel, D. (2017). Chronic Lead Exposure: A Non-Traumatic Brain Injury. Retrieved from <https://www.biausa.org/public-affairs/public-awareness/news/chronic-lead-exposure-a-non-traumatic-brain-injury>
37. World Health Organization. (2019). Lead poisoning and health. Retrieved from <https://www.who.int/news-room/fact-sheets/detail/lead-poisoning-and-health>
38. Giroud, C., de Cesare, M., Berthet, A., Varlet, V., Concha-Lozano, N., & Favrat, B. (2015). E-Cigarettes: A Review of New Trends in Cannabis Use. *International Journal of Environmental Research and Public Health*, 12(8). Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4555324/>
39. Simmons, A., Rouf, E., & Whittle, J. (2007). Not your typical pneumonia: a case of exogenous lipoid pneumonia. *Journal of General Internal Medicine*, 22(11), 1613-1616. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2219803/>
40. Centers for Disease Control and Prevention. "Synthetic marijuana: a dangerous drug at a cheap price." Last Modified December 12, 2013, accessed August 14, 2017. https://www.cdc.gov/nceh/hsb/synthetic_marijuana.htm
41. Senate Bill 2341, 100th General Assembly. (2018). Retrieved from <http://www.ilga.gov/legislation/billstatus.asp?DocNum=2341&GAID=14&GA=100&DocTypeID=SB&LegID=1088566&SessionID=91>
42. Illinois Department of Public Health. (2018). Fourth Death Related to Synthetic Cannabinoids. Retrieved from <http://www.dph.illinois.gov/news/fourth-death-related-synthetic-cannabinoids>



USING MARIJUANA UNDER THE AGE OF 21

Choosing to use cannabis (marijuana, hashish, weed, pot, edibles, etc.) before 21 can affect the plans you've made for your future.

WEED USE AFFECTS YOUR PERFORMANCE

These facts about how cannabis use influences your body and brain will help you make informed decisions about your health.



BRAIN

Human brains do not fully develop until our mid-20s. Regular cannabis use before then can lead to harmful physical changes that can permanently impact your memory, learning, and attention.^{1,2}



LUNGS

Like tobacco, smoking cannabis can harm your lungs. Marijuana smoke has many of the same toxins and chemicals found in tobacco smoke, and inhaling them increases your risk of developing lung problems.^{3,4}



SUCCESS

Research shows that if you start using cannabis before you are 18 or use cannabis regularly you may be at higher risk for:

- Skipping classes¹²
- Getting lower grades¹³
- Dropping out of school¹⁴
- Unemployment or not getting the kind of job you want^{14,15}



DRIVING

Cannabis can negatively affect the skills that are needed to drive safely, including reaction time, coordination and concentration, increasing the risk of getting into a car crash.^{10,11}



MENTAL HEALTH

Regular marijuana users are significantly more likely than nonusers to develop long-lasting mental disorders, including anxiety and depression.^{5,6} Individuals with a family history of mental illness are at an even higher risk.^{7,8,9}



YOUR RECORD

If you are under 21 and caught in possession of weed without a valid medical marijuana ID, you will face legal consequences, as will the person over 21 who supplied you with weed.



WEED USE ISN'T THAT POPULAR

In 2018, only about 1 in 5 high school students in Illinois reported using cannabis in the past 30 days.¹⁶

For more about Illinois' cannabis law, check out [LetsTalkCannabisIL.com/The-Law](https://letsstalkcannabisil.com/the-law).

If you have additional questions regarding nonmedical marijuana use in Illinois, please email letstalkcannabisil@prevention.org.



REFERENCES

1. Batalla, A., S. Bhattacharya, M. Yucel, P. Fusar-Poli, J. A. Crippa, S. Nogue, M. Torrens, J. Pujol, M. Farre, and R. Martin-Santos. 2013. "Structural and functional imaging studies in chronic cannabis users: a systematic review of adolescent and adult findings." *PLoS One* 8 (2):e55821. doi: 10.1371/journal.pone.0055821.
2. Brody, S. J., H. H. van Hell, C. Beale, M. Yucel, and N. Solowij. 2016. "Acute and Chronic Effects of Cannabinoids on Human Cognition-A Systematic Review." *Biol Psychiatry* 79 (7):557-67. doi: 10.1016/j.biopsych.2015.12.002.
3. Moir, D., W. S. Rickert, G. Levasseur, Y. Larose, R. Maertens, P. White, and S. Desjardins. 2008. "A comparison of mainstream and sidestream marijuana and tobacco cigarette smoke produced under two machine smoking conditions." *Chem Res Toxicol* 21 (2):494-502. doi: 10.1021/tx700275p.
4. Tashkin, D. P. 2013. "Effects of marijuana smoking on the lung." *Ann Am Thorac Soc* 10 (3):239-47. doi: 10.1513/AnnalsATS.201212-127FR.
5. National Academies of Sciences, E. and M., Health and Medicine Division, Board on Population Health and Public Health Practice, & Committee on the Health Effects of Marijuana: An Evidence Review and Research Agenda. (2017).
6. The Health Effects of Cannabis and Cannabinoids: The Current State of Evidence and Recommendations for Research. Washington, DC: National Academies Press. Retrieved from <https://www.ncbi.nlm.nih.gov/books/NBK425748/>
7. Kedzior, K. K., and L. T. Laeber. 2014. "A positive association between anxiety disorders and cannabis use or cannabis use disorders in the general population--a meta-analysis of 31 studies." *BMC Psychiatry* 14:136. doi:10.1186/1471-244x-14-136.
8. Lev-Ran, S., B. Le Foll, K. McKenzie, T. P. George, and J. Rehm. 2013. "Bipolar disorder and co-occurring cannabis use disorders: characteristics, co-morbidities and clinical correlates." *Psychiatry Res* 209 (3):459-65. doi: 10.1016/j.psychres.2012.12.014.
9. Borges, G., C. L. Bagge, and R. Orozco. 2016. "A literature review and meta-analyses of cannabis use and suicidality." *J Affect Disord* 195:63-74. doi: 10.1016/j.jad.2016.02.007.
10. Hartman, R. L., and M. A. Huestis. 2013. "Cannabis effects on driving skills." *Clin Chem* 59 (3):478-92. doi: 10.1373/clinchem.2012.194381.
11. Rogeberg, O., and R. Elvik. 2016. "The effects of cannabis intoxication on motor vehicle collision revisited and revised." *Addiction* 111 (8):1348-59. doi: 10.1111/add.13347.
12. Arria, A. M., L. M. Garnier-Dykstra, E. T. Cook, K. M. Caldeira, K. B. Vincent, R. A. Baron, and K. E. O'Grady. 2013. "Drug use patterns in young adulthood and post-college employment." *Drug Alcohol Depend* 127 (1-3):23-30. doi: 10.1016/j.drugalcdep.2012.06.001.
13. Macleod, J., R. Oakes, A. Copello, I. Crome, M. Egger, M. Hickman, T. Oppenkowski, H. Stokes-Lampard, and G. Davey Smith. 2004. "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):1579-88. doi: 10.1016/s0140-6736(04)16200-4.
14. Fergusson, D. M., and J. M. Boden. 2008. "Cannabis use and later life outcomes." *Addiction* 103 (6):969-76; discussion 977-8. doi: 10.1111/j.1360-0443.2008.02221.x.
15. Zhang, C., J. S. Brook, C. G. Leukefeld, and D. W. Brook. 2016. "Trajectories of marijuana use from adolescence to adulthood as predictors of unemployment status in the early forties." *Am J Addict* 25 (3):203-9. doi:10.1111/ajad.12361.
16. Illinois Department of Health Services. 2018. "Illinois Youth Survey: 2018 Frequency Report for the State of Illinois. Weighted Sample to Represent the State of Illinois." Retrieved from: https://iys.cprd.illinois.edu/UserFiles/servers/server_178052/File/state-reports/2018/freq18_iys_statewide.pdf



USAR MARIHUANA ANTES DE LOS 21 AÑOS

Elegir usar cannabis (marihuana, hachís, hierba, mota, comestibles, etc.) antes de los 21 puede afectar los planes que haz hecho para tu futuro.

USAR MARIHUANA AFECTA TU RENDIMIENTO

Estos datos sobre cómo el consumo de cannabis influye en tu cuerpo y tu cerebro te ayudarán a tomar decisiones informadas sobre tu salud.



EL CEREBRO

Los cerebros humanos terminan de desarrollarse por completo hasta alrededor de los 25 años. El consumo regular de cannabis antes de ese momento puede provocar cambios físicos dañinos que pueden afectar permanentemente la memoria, el aprendizaje y la atención.^{1,2}



LOS PULMONES

Al igual que el tabaco, fumar cannabis puede dañar tus pulmones. El humo de la marihuana tiene muchas de las mismas toxinas y sustancias químicas que se encuentran en el humo del tabaco, y su inhalación aumenta el riesgo de desarrollar problemas pulmonares.^{3,4}



ÉXITO

Las investigaciones muestran que si comienzas a usar cannabis antes de los 18 años o usas cannabis con regularidad, puedes correr un mayor riesgo de:

- Faltar a clases¹²
- Obtener calificaciones bajas¹³
- Abandonar la escuela¹⁴
- Desempleo o no conseguir el tipo de trabajo que deseas^{14,15}



CONducIR

El cannabis puede afectar negativamente las habilidades necesarias para conducir de forma segura, incluyendo el tiempo de reacción, la coordinación y la concentración, lo que aumenta el riesgo de sufrir un accidente automovilístico.^{10,11}



SALUD MENTAL

Los consumidores habituales de marihuana tienen una probabilidad significativamente mayor que quienes no consumen de desarrollar trastornos mentales de larga duración, como ansiedad y depresión.^{5,6} Las personas con antecedentes familiares de enfermedades mentales corren aún mayor riesgo.^{7,8,9}



REGISTRO PENAL

Si eres menor de 21 años y te descubren en posesión de marihuana sin una identificación válida de marihuana medicinal, enfrentarás consecuencias legales, al igual que la persona mayor de 21 años que te proporcionó la marihuana.



USAR MARIHUANA NO ES TAN POPULAR

En 2018, solo alrededor de uno de cada cinco estudiantes de secundaria en Illinois reportó haber consumido cannabis en los últimos 30 días.¹⁶

Para obtener más información sobre la ley de cannabis de Illinois, visita [LetsTalkCannabisIL.com/The-Law](https://letsstalkcannabisil.com/the-law).

Si tienes preguntas adicionales sobre el uso de marihuana no medicinal en Illinois, envía un correo electrónico a letstalkcannabisil@prevention.org.



REFERENCIAS

1. Batalla, A., S. Bhattacharya, M. Yucel, P. Fusar-Poli, J. A. Crippa, S. Nogue, M. Torrens, J. Pujol, M. Farre, and R. Martin-Santos. 2013. "Structural and functional imaging studies in chronic cannabis users: a systematic review of adolescent and adult findings." *PLoS One* 8 (2):e55821. doi: 10.1371/journal.pone.0055821.
2. Broyd, S. J., H. H. van Hell, C. Beale, M. Yucel, and N. Solowij. 2016. "Acute and Chronic Effects of Cannabinoids on Human Cognition-A Systematic Review." *Biol Psychiatry* 79 (7):557-67. doi: 10.1016/j.biopsych.2015.12.002.
3. Moir, D., W. S. Rickert, G. Levasseur, Y. Larose, R. Maertens, P. White, and S. Desjardins. 2008. "A comparison of mainstream and sidestream marijuana and tobacco cigarette smoke produced under two machine smoking conditions." *Chem Res Toxicol* 21 (2):494-502. doi: 10.1021/tx700275p.
4. Tashkin, D. P. 2013. "Effects of marijuana smoking on the lung." *Ann Am Thorac Soc* 10 (3):239-47. doi: 10.1513/AnnalsATS.201212-127FR.
5. National Academies of Sciences, E. and M., Health and Medicine Division, Board on Population Health and Public Health Practice, & Committee on the Health Effects of Marijuana: An Evidence Review and Research Agenda. (2017).
6. The Health Effects of Cannabis and Cannabinoids: The Current State of Evidence and Recommendations for Research. Washington, DC: National Academies Press. Retrieved from <https://www.ncbi.nlm.nih.gov/books/NBK425748/>
7. Kedzior, K. K., and L. T. Laeber. 2014. "A positive association between anxiety disorders and cannabis use or cannabis use disorders in the general population--a meta-analysis of 31 studies." *BMC Psychiatry* 14:136. doi:10.1186/1471-244x-14-136.
8. Lev-Ran, S., B. Le Foll, K. McKenzie, T. P. George, and J. Rehm. 2013. "Bipolar disorder and co-occurring cannabis use disorders: characteristics, co-morbidities and clinical correlates." *Psychiatry Res* 209 (3):459-65. doi: 10.1016/j.psychres.2012.12.014.
9. Borges, G., C. L. Bagge, and R. Orozco. 2016. "A literature review and meta-analyses of cannabis use and suicidality." *J Affect Disord* 195:63-74. doi: 10.1016/j.jad.2016.02.007.
10. Hartman, R. L., and M. A. Huestis. 2013. "Cannabis effects on driving skills." *Clin Chem* 59 (3):478-92. doi: 10.1373/clinchem.2012.194381.
11. Rogeberg, O., and R. Elvik. 2016. "The effects of cannabis intoxication on motor vehicle collision revisited and revised." *Addiction* 111 (8):1348-59. doi: 10.1111/add.13347.
12. Arria, A. M., L. M. Garnier-Dykstra, E. T. Cook, K. M. Caldeira, K. B. Vincent, R. A. Baron, and K. E. O'Grady. 2013. "Drug use patterns in young adulthood and post-college employment." *Drug Alcohol Depend* 127 (1-3):23-30. doi: 10.1016/j.drugalcdep.2012.06.001.
13. Macleod, J., R. Oakes, A. Copello, I. Crome, M. Egger, M. Hickman, T. Oppenkowski, H. Stokes-Lampard, and G. Davey Smith. 2004. "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):1579-88. doi: 10.1016/s0140-6736(04)16200-4.
14. Fergusson, D. M., and J. M. Boden. 2008. "Cannabis use and later life outcomes." *Addiction* 103 (6):969-76; discussion 977-8. doi: 10.1111/j.1360-0443.2008.02221.x.
15. Zhang, C., J. S. Brook, C. G. Leukefeld, and D. W. Brook. 2016. "Trajectories of marijuana use from adolescence to adulthood as predictors of unemployment status in the early forties." *Am J Addict* 25 (3):203-9. doi:10.1111/ajad.12361.
16. Illinois Department of Health Services. 2018. "Illinois Youth Survey: 2018 Frequency Report for the State of Illinois. Weighted Sample to Represent the State of Illinois." Retrieved from: https://iys.cprd.illinois.edu/UserFiles/servers/server_178052/File/state-reports/2018/freq18_iys_statewide.pdf



WHAT'S LEGAL FOR ADULTS 21+

As of 1/1/2020 non-medical cannabis (marijuana, hashish, weed, pot, edibles, etc.) use is legal for adults 21+ in Illinois. This new law outlines specific parameters regarding possession, consumption, and other activities related to non-medical cannabis use. This law will not impact the Medical Cannabis Pilot Program Act. Here are a few things you should know.

WHO CAN POSSESS AND HOW MUCH?

- Adults age 21+ who are residents of Illinois can possess up to the following amounts of cannabis:
 - 30 grams (1 oz) of cannabis flower
 - 5 grams of cannabis concentrate
 - 500 milligrams of THC within cannabis-infused products
- While in the state, U.S. citizens who don't live in Illinois can possess up to half of the amounts above.
- Anyone younger than 21 is prohibited from possessing any amount of cannabis.

BUYING, SELLING, GIVING, & GROWING

- It is illegal to purchase from anyone besides licensed cannabis dispensaries registered with the state of Illinois.
- When purchasing from dispensaries, you must show a valid government-issued photo ID with your date of birth.
- Non-medical cannabis users may not grow any amount of cannabis.
- Medical marijuana cardholders are permitted to grow up to 5 plants.



CAN

- In a private home if out of public view, with no one under 21 years of age present, *and* approved by the property owner
- In some cannabis-related businesses

CAN'T

- In any public space (including private homes where use is in public view)
- On any private property of which the property owner does NOT approve (including individual owners, landlords, businesses, & colleges)
- In front of anyone under the age of 21
- On any federal land (including national parks in Illinois and Section 8 government-funded housing)
- In any motorized vehicle, including boats and motorcycles, even as a passenger
- Across state borders-cannabis purchased in Illinois must be used in Illinois



DRIVERS AND PASSENGERS

- Like with alcohol, operating a motorized vehicle under the influence of cannabis can result in a DUI.
 - Law enforcement has the right to pull you over and conduct a sobriety test.
 - You could lose your license and face additional legal consequences.
- If you have cannabis in a vehicle, it must be in a closed container out of reach of the driver.

OTHER LAWS



- Just like alcohol, if cannabis is used by someone under 21 on the property of an adult over 21+, that adult can be held legally liable.
- Federal law does not permit the use, possession, or cultivation of cannabis (in any amount).
- Illegal cannabis use could still subject you to state and/or federal prosecution.
- As cannabis is not legal at the federal level, use or possession of ANY amount of cannabis by immigrants and non-US citizens could affect their immigration status and result in deportation.

See sources and learn more about Illinois' cannabis law by reading Public Act 101-0027:

<https://bit.ly/2EXAJSb>.

If you have additional questions regarding nonmedical cannabis use in Illinois, please email letstalkcannabisIL@prevention.org.

HOW WILL THIS LAW HELP ILLINOIS COMMUNITIES?

- Adults previously convicted of possessing less than the new legal limit may have their records expunged as long as their arrest did not involve a violent crime.
- 25% of cannabis sales tax revenue will help revitalize communities most affected by drug use.
- 20% of cannabis sales revenue will help address mental health issues and substance abuse & prevention efforts.
- 8% of cannabis sales revenue will help prevent local crime.
- Illinois will help lower licensing fees for, and provide low-interest business loans to, minority entrepreneurs interested in entering the cannabis industry.

LEGAL CONSEQUENCES

- There are several penalties for violating Illinois' cannabis laws including:
 - Fines
 - Community Service
 - Drug Education
 - Jail Time

For more on the health risks of cannabis use for underaged individuals and adults 21+, check out LetstalkCannabisIL.com/Using-Marijuana.



QUÉ ES LEGAL PARA ADULTOS MAYORES DE 21

A partir del primero de enero del 2020, el uso de cannabis no medicinal (marihuana, hachís, hierba, mota, comestibles, etc.) es legal para adultos mayores de 21 años en Illinois. Esta nueva ley describe parámetros específicos con respecto a la posesión, el consumo y otras actividades relacionadas con el uso de cannabis con fines no medicinal. Esta ley no afectará la Ley del Programa Piloto de Cannabis Medicinal. Aquí hay algunas cosas que debes saber.

¿QUIÉN PUEDE POSEER Y CUÁNTO?

- Los adultos mayores de 21 años que residen en Illinois pueden poseer hasta las siguientes cantidades de cannabis:
 - 30 gramos (1 oz) de flor de cannabis
 - 5 gramos de concentrado de cannabis
 - 500 miligramos de THC en productos con infusión de cannabis
- Mientras estén en el estado, los ciudadanos estadounidenses que no vivan en Illinois pueden poseer hasta la mitad de los montos anteriores
- Cualquier persona menor de 21 años tiene prohibido poseer cualquier cantidad de cannabis

COMPRAR, VENDER, DAR Y CULTIVAR

- Es ilegal comprar de cualquier persona o lugar que no sea un dispensario de cannabis con licencia registrado en el estado de Illinois.
- Al comprar en dispensarios, debes mostrar una identificación con foto válida emitida por el gobierno que tenga tu fecha de nacimiento.
- Los consumidores de cannabis no medicinal no pueden cultivar ninguna cantidad de cannabis.
- Los titulares de tarjetas de marihuana medicinal pueden cultivar hasta 5 plantas.



DÓNDE PUEDES Y NO PUEDES USAR

SÍ PUEDES

- En una casa privada si estás fuera de la vista del público, sin nadie menor de 21 años presente y que esté aprobado por el dueño de la propiedad
- En algunos negocios relacionados con el cannabis

NO PUEDES

- En cualquier espacio público (incluyendo las casas privadas donde el uso está a la vista del público)
- En cualquier propiedad privada donde el propietario NO apruebe (incluyendo los propietarios individuales, los arrendadores, las empresas y las universidades)
- Delante de cualquier persona menor de 21 años
- En cualquier terreno federal (incluyendo los parques nacionales de Illinois y las viviendas financiadas por el gobierno de la Sección 8)
- En cualquier vehículo motorizado, incluyendo barcos y motocicletas, aun como pasajero
- Afuera de las fronteras estatales: el cannabis comprado en Illinois debe usarse en Illinois

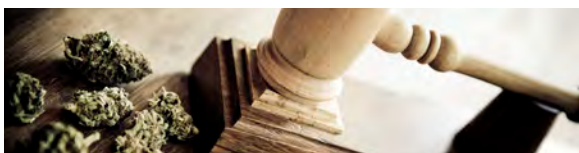


QUÉ ES LEGAL PARA ADULTOS MAYORES DE 21

CONDUCTORES Y PASAJEROS

- Al igual que con el alcohol, operar un vehículo motorizado bajo la influencia del cannabis puede resultar en cargos por delito (DUI, por sus siglas en inglés).
 - La policía tiene derecho a detenerte y realizarte una prueba de sobriedad.
 - Podrías perder tu licencia y enfrentar consecuencias legales adicionales.
- Si tienes cannabis en un vehículo, debe estar en un recipiente cerrado fuera del alcance del conductor.

OTRAS LEYES



- Al igual que el alcohol, si alguien menor de 21 años consume cannabis en la propiedad de un adulto mayor de 21 años, ese adulto puede ser considerado legalmente responsable.
- La ley federal no permite el uso, posesión o cultivo de cannabis (en ninguna cantidad).
- El consumo ilegal de cannabis te puede someter a cargos por delito estatal y/o federal.
- Como el cannabis no es legal a nivel federal, el uso o posesión de CUALQUIER cantidad de cannabis por parte de inmigrantes y ciudadanos no estadounidenses podría afectar su estado migratorio y resultar en la deportación.

Consulta las fuentes y obtén más información sobre la ley de cannabis de Illinois leyendo la Ley Pública 101-0027:

<https://bit.ly/2EXAJSb>.

Si tienes preguntas adicionales sobre el consumo de cannabis con fines no medicinales en Illinois, envía un correo electrónico letstalkcannabisIL@prevention.org.

¿CÓMO ESTA LEY AYUDARÁ A LAS COMUNIDADES DE ILLINOIS?

- A los adultos previamente condenados por poseer menos del nuevo límite legal se les puede borrar su registro penal siempre y cuando su arresto no implique un delito violento.
- El 25% de los ingresos por impuestos a las ventas de cannabis ayudará a revitalizar las comunidades más afectadas por el consumo de drogas.
- El 20% de los ingresos por ventas de cannabis ayudará a abordar los problemas de salud mental y los esfuerzos de prevención y abuso de sustancias.
- El 8% de los ingresos por ventas de cannabis ayudará a prevenir la delincuencia local.
- Illinois ayudará a reducir las tarifas de licencias y proporcionará préstamos comerciales a bajo interés a los empresarios minoritarios interesados en ingresar a la industria del cannabis.

CONSECUENCIAS LEGALES

- Existen varias sanciones por violar las leyes de cannabis de Illinois, que incluyen:
 - Multas
 - Servicio comunitario
 - Educación sobre drogas
 - Tiempo en prisión

Para obtener más información sobre los riesgos para la salud del consumo de cannabis para personas menores de edad y adultos mayores de 21 años, consulta [LetsTalkCannabisIL.com/Using-Marijuana](https://letsstalkcannabisil.com/Using-Marijuana).

DrugFacts

Revised June 2020

Cannabis (Marijuana) Concentrates DrugFacts

Cannabis plants are covered by microscopic, mushroom-shaped, hair-like compounds called trichomes. These outgrowths surround the budding marijuana flower and produce the plant's cannabinoids. Different varieties of trichomes can be collected. The resulting products—collectively called cannabis concentrates—can contain very high levels of tetrahydrocannabinol, commonly referred to as THC, the psychotropic ingredient in marijuana. These THC-rich marijuana products may be vaporized and inhaled using a vape pen or through a process called dabbing.¹

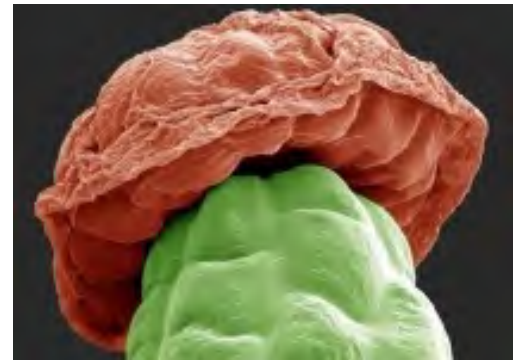


Image courtesy of [University of Mississippi](#)

Trichomes on marijuana flower.

How are concentrates made?

Marijuana concentrates can be made in a commercial environment with modern equipment or prepared in a home setting.² They are produced in various ways, including:

- dry processing
- dry ice processing
- water-based processing
- combining pressure with heat
- using nonflammable carbon dioxide solvents

- using flammable solvents, including butane (lighter fluid), propane, ether or alcohol¹

Using flammable solvents is popular because the products have high THC levels,¹ users report longer-lasting effects,¹ and it is a relatively inexpensive and efficient production method.² Butane is a commonly used solvent, producing the potent marijuana concentrate *butane hash oil* (BHO).²

What does the final product look like?

The products resulting from these methods may be:

- a goeey liquid wax
- a soft solid with a texture like lip balm
- a hard, amber-colored solid

Hash oil and waxes can be consumed using vape pens. Solids can also be placed on a heated platform usually made of titanium, quartz, or ceramic, where they are vaporized by high heat and inhaled through a dabbing tool, often called a rig.²



Image courtesy of pixabay.com, CC0

What's the difference between concentrates, extracts, and dabs?

The terms used to describe these products vary. Concentrates is a broad term referring to all products that have been extracted from the plant. Although extracts and concentrates are often used interchangeably, some people define extracts as products manufactured using solvents, but not those pulled from the plant with non-solvent methods. Dabs may refer to products made exclusively from butane hash oil; however, the term is sometimes used colloquially for concentrates extracted in other ways. There are also post-production methods that lead to further variations in products and terms.³

What are the health effects of concentrates?

There are adverse effects associated with marijuana use in any form,³ though additional research is needed to understand how the use of concentrate may differ from smoking dried marijuana buds. Marijuana concentrates have very high levels of THC. Solvent-based products tend to be especially

potent, with THC levels documented at an average of about 54-69% and reported to exceed 80%, while non-solvent based extraction methods produce average THC levels between 39-60%.⁴ In comparison, the THC content in marijuana plant material, which is often used in marijuana cigarettes, is lower—with samples seized by the U.S. Drug Enforcement Agency averaging just over 15%.⁵ Not only do concentrates have high levels of THC, but dabbers inhale the entire amount all at once—in a single breath.² As a result, concentrates can deliver extremely large amounts of THC to the body quickly. The risks of physical dependence and addiction increase with exposure to high concentrations of THC, and higher doses of THC are more likely to produce anxiety, agitation, paranoia, and psychosis.⁶ Additional research is needed to understand how the use of concentrate affects these risks.

In addition, contaminants in concentrate products may be cause for concern. One study noted that 80% of tested concentrate samples were contaminated in some form, not only with pesticides (which is also a concern for dried bud), but also with residual solvents that were not fully purged in the manufacturing process. Users of BHO, for example, likely inhale some butane and other impurities along with the vaporized THC.² It is important to note that direct inhalation of concentrated butane among recreational inhalant users carries multiple risks, including reported deaths.⁷ However, it is unclear what negative health outcomes result from the inhalation of residual butane, other solvents, or leftover contaminants during the dabbing process.

Is it dangerous to make solvent-based concentrates?

When solvents are used to produce concentrates, the preparation process itself can be dangerous. A number of people using butane to make extracts at home have caused fires and explosions and have been seriously burned.⁸ A study conducted in 2015 looking at implications from marijuana legalization in Colorado reported that in a 2-year period the University of Colorado burn center saw a substantial increase in the number of flash burns that occurred during amateur THC extraction using butane, some involving more than 70% of body surface area and most requiring skin grafting.⁹

It is against federal law to manufacture BHO,¹⁰ and even in some states where adult use of marijuana is legal, like Colorado and California, it is illegal to make hash oil using flammable liquids. In Colorado, state officials recommend alternate methods using nonflammable dry ice (CO₂), ice water, or purchasing the product from a licensed marijuana retail store.¹¹ Most licensed, commercial production

facilities use a safer extraction system that prevents solvents from being wasted or exposed to the open air where they could inadvertently be ignited, similar to decades-old systems used in the production of many commercial products.²

Points to Remember

- Cannabis plants are covered by microscopic, mushroom-shaped, hair-like compounds called trichomes which surround the budding marijuana flower and produce the plant's cannabinoids.
- Trichomes can be collected and made into concentrates, including extracts and dabs.
- Concentrates can contain very high levels of THC, the psychotropic ingredient in marijuana.
- Concentrates can be vaporized and inhaled using a vape pen or by dabbing.
- Concentrates can be made in commercial settings or in a home through several methods, including dry ice- and water-based processing and the use of solvents.
- Using flammable solvents, such as butane, propane, ether or alcohol, is popular because it produces high THC levels, longer-lasting effects, and it's relatively inexpensive.
- Using butane as a solvent produces the potent marijuana concentrate butane hash oil (BHO).
- Exposure to high levels of THC increases the risks of physical dependence and addiction. Higher doses of THC are more likely to produce anxiety, agitation, paranoia, and psychosis.
- Contamination with pesticides and residual solvents that weren't fully removed during production is a concern. People who use BHO likely inhale some butane and other impurities along with the vaporized THC.

Learn More

For more information about marijuana and marijuana use visit

- [Marijuana webpage](#)
- [Drugged Driving DrugFacts](#)

References

1. Raber JC, Elzinga S, Kaplan C. Understanding dabs: Contamination concerns of cannabis concentrates and cannabinoid transfer during the act of dabbing. *J Toxicol Sci.* 2015;40(6):797-803. doi: 10.2131/jts.40.797
2. Al-Zouabi I, Stogner JM, Miller BL, Lane ES. Butane hash oil and dabbing: Insights into use, amateur production techniques, and potential harm mitigation. *Subst Abuse Rehabil.* 2018;9: 91–101.
3. Volkow ND, Baler RD, Compton WM, Weiss SRB. Adverse Health Effects of Marijuana Use. *N Engl J Med.* 2014;370(23): 2219–2227. doi:10.1056/NEJMra1402309.
4. Meier MH, Docherty M, Leischow SJ, Grimm KJ, Pardini D. Cannabis concentrates use in adolescents. *Pediatrics.* 2019;144(3):e20190338. doi:10.1542/peds.2019-0338.
5. National Institute on Drug Abuse. Is marijuana addictive?. nida.nih.gov/publications/research-reports/marijuana/marijuana-addictive. Updated April 8, 2020. Accessed June 17, 2020.
6. Freeman TP, Winstock AR. Examining the profile of high-potency cannabis and its association with severity of cannabis dependence. *Psychol Med.* 2015;45(15):3181-9. doi: 10.1017/S0033291715001178.
7. Sironi L, Amadasi A, Zoja R. Recreational inhalation of butane and propane in adolescents: Two forensic cases of accidental death. *Forensic Sci Int.* 2016;266:e52-e58. doi: 10.1016/j.forsciint.2016.05.028.
8. Romanowski KS, Barsun A, Kwan P, et al. Butane hash oil burns: A 7-Year perspective on a growing problem. *J Burn Care Res.* 2017;38(1):e165-e171. doi: 10.1097/BCR.0000000000000334
9. Monte AA, Zane RD, Heard KJ. The implications of marijuana legalization in Colorado. *JAMA.* 2015;313(3):241-2. doi: 10.1001/jama.2014.17057.
10. Two charged in connection with drug lab explosion. dea.gov. <https://www.dea.gov/press-releases/2018/09/06/two-charged-connection-drug-lab-explosion>. Published September 6, 2018. Accessed June 17, 2020.
11. Safety with hash oil. Colorado.gov. colorado.gov/pacific/marijuana/safety-hash-oil Accessed June 17, 2020.

This publication is available for your use and may be reproduced in its entirety without permission from NIDA. Citation of the source is appreciated, using the following language: Source: National Institute on Drug Abuse; National Institutes of Health; U.S. Department of Health and Human Services.

DrugFacts

Revised December 2019

Cannabis (Marijuana) DrugFacts

What is marijuana?

Marijuana refers to the dried leaves, flowers, stems, and seeds from the *Cannabis sativa* or *Cannabis indica* plant. The plant contains the mind-altering chemical THC and other similar compounds. Extracts can also be made from the cannabis plant (see "[Marijuana Extracts](#)").

Marijuana is the most commonly used addictive drug after tobacco and alcohol.¹ Its use is

widespread among young people. In 2018, more than 11.8 million young adults used marijuana in the past year.¹ According to the [Monitoring the Future survey](#), rates of past year marijuana use among middle and high school students have remained steady, but the number of teens in 8th and 10th grades who say they use it daily has increased. With the growing popularity of vaping devices, teens have started vaping THC (the ingredient in marijuana that produces the high), with nearly 4% of 12th graders saying they vape THC daily. In addition, the number of young people who believe regular marijuana use is risky is decreasing.²



Photo by NIDA

Legalization of marijuana for medical use or adult recreational use in a growing number of states may affect these views. Read more about marijuana as medicine in our [DrugFacts: Marijuana as Medicine](#).

How do people use marijuana?

People smoke marijuana in hand-rolled cigarettes (joints) or in pipes or water pipes (bongs). They also smoke it in blunts—emptied cigars that have been partly or completely refilled with marijuana. To avoid inhaling smoke, some people are using vaporizers. These devices pull the active ingredients (including THC) from the marijuana and collect their vapor in a storage unit. A person then inhales the vapor, not the smoke. Some vaporizers use a liquid marijuana extract.



Image by ©Shutterstock/[Stephen Orsillo](#)

People can mix marijuana in food (*edibles*), such as brownies, cookies, or candy, or brew it as a tea. A newly popular method of use is smoking or eating different forms of THC-rich resins (see "[Marijuana Extracts](#)").

Marijuana Extracts

Smoking THC-rich resins extracted from the marijuana plant is on the rise. People call this practice *dabbing*. These extracts come in various forms, such as:

- *hash oil or honey oil*—a gooey liquid
- *wax or budder*—a soft solid with a texture like lip balm
- *shatter*—a hard, amber-colored solid

These extracts can deliver extremely large amounts of THC to the body, and their use has sent some people to the emergency room. Another danger is in preparing these extracts, which usually involves butane (lighter fluid). A number of people have caused fires and explosions and have been seriously burned from using butane to make extracts at home.^{3,4}

How does marijuana affect the brain?

Marijuana has both short-and long-term effects on the brain.

Short-Term Effects

When a person smokes marijuana, THC quickly passes from the lungs into the bloodstream. The blood carries the chemical to the brain and other organs throughout the body. The body absorbs THC more slowly when the person eats or drinks it. In that case, they generally feel the effects after 30 minutes to 1 hour.

THC acts on specific brain cell receptors that ordinarily react to natural THC-like chemicals. These natural chemicals play a role in normal brain development and function.

Marijuana over activates parts of the brain that contain the highest number of these receptors. This causes the "high" that people feel. Other effects include:

- altered senses (for example, seeing brighter colors)
- altered sense of time
- changes in mood
- impaired body movement
- difficulty with thinking and problem-solving

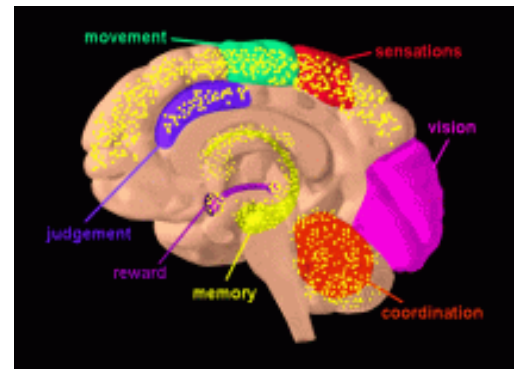


Image by NIDA

THC acts on numerous areas in the brain (in yellow).

- impaired memory
- hallucinations (when taken in high doses)
- delusions (when taken in high doses)
- psychosis (risk is highest with regular use of high potency marijuana)

Long-Term Effects

Marijuana also affects brain development. When people begin using marijuana as teenagers, the drug may impair thinking, memory, and learning functions and affect how the brain builds connections between the areas necessary for these functions. Researchers are still studying how long marijuana's effects last and whether some changes may be permanent.

For example, a study from New Zealand conducted in part by researchers at Duke University showed that people who started smoking marijuana heavily in their teens and had an ongoing marijuana use disorder lost an average of 8 IQ points between ages 13 and 38. The lost mental abilities didn't fully return in those who quit marijuana as adults. Those who started smoking marijuana as adults didn't show notable IQ declines.⁵

In another recent study on twins, those who used marijuana showed a significant decline in general knowledge and in verbal ability (equivalent to 4 IQ points) between the preteen years and early adulthood, but no predictable difference was found between twins when one used marijuana and the other didn't. This suggests that the IQ decline in marijuana users may be caused by something other than marijuana, such as shared familial factors (e.g., genetics, family environment).⁶ NIDA's Adolescent Brain Cognitive Development (ABCD) study, a major longitudinal study, is tracking a large sample of young Americans from late childhood to early adulthood to help clarify how and to what extent marijuana and other substances, alone and in combination, affect adolescent brain development. Read more about the ABCD study on our [Longitudinal Study of Adolescent Brain and Cognitive Development \(ABCD Study\)](#) webpage.

A Rise in Marijuana's THC Levels

The amount of THC in marijuana has been increasing steadily over the past few decades.⁷ For a person who's new to marijuana use, this may mean exposure to higher THC levels with a greater chance of a harmful reaction. Higher THC levels may explain the rise in emergency room visits involving marijuana use.

The popularity of edibles also increases the chance of harmful reactions. Edibles take longer to digest and produce a high. Therefore, people may consume more to feel the effects faster, leading to dangerous results.

Higher THC levels may also mean a greater risk for addiction if people are regularly exposing themselves to high doses.

What are the other health effects of marijuana?

Marijuana use may have a wide range of effects, both physical and mental.

Physical Effects

- **Breathing problems.** Marijuana smoke irritates the lungs, and people who smoke marijuana frequently can have the same breathing problems as those who smoke tobacco. These problems include daily cough and phlegm, more frequent lung illness, and a higher risk of lung infections.⁸ Researchers so far haven't found a higher risk for lung cancer in people who smoke marijuana.
- **Increased heart rate.** Marijuana raises heart rate for up to 3 hours after smoking. This effect may increase the chance of heart attack. Older people and those with heart problems may be at higher risk.
- **Problems with child development during and after pregnancy.** One study found that about 20% of pregnant women 24-years-old and younger screened positive for marijuana. However, this study also found that women were about twice as likely to screen positive for marijuana use via a drug test than they state in self-reported measures.⁹ This suggests that self-reported rates of marijuana use in pregnant females is not an accurate measure of marijuana use and may be underreporting their use. Additionally, in one study of dispensaries, nonmedical personnel at marijuana dispensaries were recommending marijuana to pregnant women for nausea, but medical experts warn against it. This concerns medical experts because marijuana use during pregnancy is linked to lower birth weight¹⁰ and increased risk of both brain and behavioral problems in babies. If

a pregnant woman uses marijuana, the drug may affect certain developing parts of the fetus's brain. Children exposed to marijuana in the womb have an increased risk of problems with attention,¹¹ memory, and problem-solving compared to unexposed children.¹² Some research also suggests that moderate amounts of THC are excreted into the breast milk of nursing mothers.¹³ With regular use, THC can reach amounts in breast milk that could affect the baby's developing brain. Other recent research suggests an increased risk of preterm births.²⁷ More research is needed. Read our [Marijuana Research Report](#) for more information about marijuana and pregnancy.

- **Intense nausea and vomiting.** Regular, long-term marijuana use can lead to some people to develop Cannabinoid Hyperemesis Syndrome. This causes users to experience regular cycles of severe nausea, vomiting, and dehydration, sometimes requiring emergency medical attention.¹⁴

Reports of Deaths Related to Vaping

The Food and Drug Administration has [alerted](#) the public to hundreds of reports of serious lung illnesses associated with vaping, including several deaths. They are working with the Centers for Disease Control and Prevention (CDC) to investigate the cause of these illnesses. Many of the suspect products tested by the states or federal health officials have been identified as vaping products containing THC, the main psychotropic ingredient in marijuana. Some of the patients reported a mixture of THC and nicotine; and some reported vaping nicotine alone. No one substance has been identified in all of the samples tested, and it is unclear if the illnesses are related to one single compound. Until more details are known, FDA officials have warned people not to use any vaping products bought on the street, and they warn against modifying any products purchased in stores. They are also asking people and health professionals to [report](#) any adverse effects. The CDC has posted an information [page](#) for consumers.



Mental Effects

Photo by ©iStock/Adrian Hillman

Long-term marijuana use has been linked to mental illness in some people, such as:

- temporary hallucinations
- temporary paranoia
- worsening symptoms in patients with *schizophrenia*—a severe mental disorder with symptoms such as hallucinations, paranoia, and disorganized thinking

Marijuana use has also been linked to other mental health problems, such as depression, anxiety, and suicidal thoughts among teens. However, study findings have been mixed.

Are there effects of inhaling secondhand marijuana smoke?

Failing a Drug Test?

While it's possible to fail a drug test after inhaling secondhand marijuana smoke, it's unlikely. Studies show that very little THC is released in the air when a person exhales. Research findings suggest that, unless people are in an enclosed room, breathing in lots of smoke for hours at close range, they aren't likely to fail a drug test.^{15,16} Even if some THC was found in the blood, it wouldn't be enough to fail a test.

Getting High from Passive Exposure?

Similarly, it's unlikely that secondhand marijuana smoke would give nonsmoking people in a confined space a high from passive exposure. Studies have shown that people who don't use marijuana report only mild effects of the drug from a nearby smoker, under extreme conditions (breathing in lots of marijuana smoke for hours in an enclosed room).¹⁷

Other Health Effects?

More research is needed to know if secondhand marijuana smoke has similar health risks as secondhand tobacco smoke. A recent study on rats suggests that secondhand marijuana smoke can do as much damage to the heart and blood vessels as secondhand tobacco smoke.²⁰ But researchers haven't fully explored the effect of secondhand marijuana smoke on humans. What they do know is

that the toxins and tar found in marijuana smoke could affect vulnerable people, such as children or people with asthma.

How Does Marijuana Affect a Person's Life?

Compared to those who don't use marijuana, those who frequently use large amounts report the following:

- lower life satisfaction
- poorer mental health
- poorer physical health
- more relationship problems

People also report less academic and career success. For example, marijuana use is linked to a higher likelihood of dropping out of school.¹⁸ It's also linked to more job absences, accidents, and injuries.¹⁹

Is marijuana a gateway drug?

Use of alcohol, tobacco, and marijuana are likely to come before use of other drugs.^{21,22} Animal studies have shown that early exposure to addictive substances, including THC, may change how the brain responds to other drugs. For example, when rodents are repeatedly exposed to THC when they're young, they later show an enhanced response to other addictive substances—such as morphine or nicotine—in the areas of the brain that control reward, and they're more likely to show addiction-like behaviors.^{23,24}

Although these findings support the idea of marijuana as a "gateway drug," the majority of people who use marijuana don't go on to use other "harder" drugs. It's also important to note that other factors besides biological mechanisms, such as a person's social environment, are also critical in a person's risk for drug use and addiction. Read more about marijuana as a gateway drug in our [Marijuana Research Report](#).

Can a person overdose on marijuana?

An [overdose](#) occurs when a person uses enough of the drug to produce life-threatening symptoms or death. There are no reports of teens or adults dying from marijuana alone. However, some people who use marijuana can feel some very uncomfortable side effects, especially when using marijuana products with high THC levels. People have reported symptoms such as anxiety and paranoia, and in rare cases, an extreme psychotic reaction (which can include delusions and hallucinations) that can lead them to seek treatment in an emergency room.

While a psychotic reaction can occur following any method of use, emergency room responders have seen an increasing number of cases involving marijuana edibles. Some people (especially preteens and teens) who know very little about edibles don't realize that it takes longer for the body to feel marijuana's effects when eaten rather than smoked. So they consume more of the edible, trying to get high faster or thinking they haven't taken enough. In addition, some babies and toddlers have been seriously ill after ingesting marijuana or marijuana edibles left around the house.

Is marijuana addictive?

Marijuana use can lead to the development of a substance use disorder, a medical illness in which the person is unable to stop using even though it's causing health and social problems in their life. Severe substance use disorders are also known as addiction. Research suggests that between 9 and 30 percent of those who use marijuana may develop some degree of marijuana use disorder.²⁵ People who begin using marijuana before age 18 are four to seven times more likely than adults to develop a marijuana use disorder.²⁶

Many people who use marijuana long term and are trying to quit report mild withdrawal symptoms that make quitting difficult. These include:

- grouchiness
- sleeplessness
- decreased appetite
- anxiety
- cravings

What treatments are available for marijuana use disorder?

No medications are currently available to treat marijuana use disorder, but behavioral support has been shown to be effective. Examples include therapy and motivational incentives (providing rewards to patients who remain drug-free). Continuing research may lead to new medications that help ease withdrawal symptoms, block the effects of marijuana, and prevent relapse.

Points to Remember

- Marijuana refers to the dried leaves, flowers, stems, and seeds from the *Cannabis sativa* or *Cannabis indica* plant.
- The plant contains the mind-altering chemical THC and other related compounds.
- People use marijuana by smoking, eating, drinking, or inhaling it.
- Smoking and vaping THC-rich extracts from the marijuana plant (a practice called *dabbing*) is on the rise.
- THC overactivates certain brain cell receptors, resulting in effects such as:
 - altered senses
 - changes in mood
 - impaired body movement
 - difficulty with thinking and problem-solving
 - impaired memory and learning
- Marijuana use can have a wide range of health effects, including:
 - hallucinations and paranoia
 - breathing problems
 - possible harm to a fetus's brain in pregnant women
- The amount of THC in marijuana has been increasing steadily in recent decades, creating more harmful effects in some people.

- It's unlikely that a person will fail a drug test or get high from passive exposure by inhaling secondhand marijuana smoke.
- There aren't any reports of teens and adults dying from using marijuana alone, but marijuana use can cause some very uncomfortable side effects, such as anxiety and paranoia and, in rare cases, extreme psychotic reactions.
- Marijuana use can lead to a substance use disorder, which can develop into an addiction in severe cases.
- No medications are currently available to treat marijuana use disorder, but behavioral support can be effective.

Learn More

For more information about marijuana and marijuana use, visit our:

- [Marijuana webpage](#)
- [Drugged Driving DrugFacts](#)

References

1. Substance Abuse Center for Behavioral Health Statistics and Quality. Results from the 2018 National Survey on Drug Use and Health: Detailed Tables. SAMHSA. <https://www.samhsa.gov/data/report/2018-nsduh-detailed-tables> Accessed December 2019.
2. Johnston L, O'Malley P, Miech R, Bachman J, Schulenberg J. Monitoring the Future National Survey Results on Drug Use: 1975-2015: *Overview: Key Findings on Adolescent Drug Use*. Ann Arbor, MI: Institute for Social Research, The University of Michigan; 2015.
3. Bell C, Slim J, Flaten HK, Lindberg G, Arek W, Monte AA. Butane Hash Oil Burns Associated with Marijuana Liberalization in Colorado. *J Med Toxicol Off J Am Coll Med Toxicol*. 2015;11(4):422-425. doi:10.1007/s13181-015-0501-0.
4. Romanowski KS, Barsun A, Kwan P, et al. Butane Hash Oil Burns: A 7-Year Perspective on a Growing Problem. *J Burn Care Res Off Publ Am Burn Assoc*. 2017;38(1):e165-e171. doi:10.1097/BCR.0000000000000334.

5. Meier MH, Caspi A, Ambler A, et al. Persistent cannabis users show neuropsychological decline from childhood to midlife. *Proc Natl Acad Sci U S A*. 2012;109(40):E2657-E2664. doi:10.1073/pnas.1206820109.
6. Jackson NJ, Isen JD, Khoddam R, et al. Impact of adolescent marijuana use on intelligence: Results from two longitudinal twin studies. *Proc Natl Acad Sci U S A*. 2016;113(5):E500-E508. doi:10.1073/pnas.1516648113.
7. Mehmedic Z, Chandra S, Slade D, et al. Potency trends of Δ^9 -THC and other cannabinoids in confiscated cannabis preparations from 1993 to 2008. *J Forensic Sci*. 2010;55(5):1209-1217. doi:10.1111/j.1556-4029.2010.01441.x.
8. National Academies of Sciences, Engineering, and Medicine. *The Health Effects of Cannabis and Cannabinoids: Current State of Evidence and Recommendations for Research*. Washington, DC: The National Academies Press; 2017.
9. Young-Wolff KC, Tucker L-Y, Alexeeff S, et al. Trends in Self-reported and Biochemically Tested Marijuana Use Among Pregnant Females in California From 2009-2016. *JAMA*. 2017;318(24):2490. doi:10.1001/jama.2017.17225
10. The National Academies of Sciences, Engineering, and Medicine, Health and Medicine Division, Board on Population Health and Public Health Practice, Committee on the Health Effects of Marijuana: An Evidence Review and Research Agenda. *The Health Effects of Cannabis and Cannabinoids: The Current State of Evidence and Recommendations for Research*. <http://nationalacademies.org/hmd/Reports/2017/health-effects-of-cannabis-and-cannabinoids.aspx>. Accessed January 19, 2017.
11. Goldschmidt L, Day NL, Richardson GA. Effects of prenatal marijuana exposure on child behavior problems at age 10. *Neurotoxicol Teratol*. 2000;22(3):325-336.
12. Richardson GA, Ryan C, Willford J, Day NL, Goldschmidt L. Prenatal alcohol and marijuana exposure: effects on neuropsychological outcomes at 10 years. *Neurotoxicol Teratol*. 2002;24(3):309-320.
13. Perez-Reyes M, Wall ME. Presence of delta9-tetrahydrocannabinol in human milk. *N Engl J Med*. 1982;307(13):819-820. doi:10.1056/NEJM198209233071311.
14. Galli JA, Sawaya RA, Friedenberf FK. Cannabinoid Hyperemesis Syndrome. *Curr Drug Abuse Rev* . 2011;4(4):241-249.
15. Röhrich J, Schimmel I, Zörntlein S, et al. Concentrations of delta9-tetrahydrocannabinol and 11-nor-9-carboxytetrahydrocannabinol in blood and urine after passive exposure to Cannabis smoke in

a coffee shop. *J Anal Toxicol*. 2010;34(4):196-203.

16. Cone EJ, Bigelow GE, Herrmann ES, et al. Non-smoker exposure to secondhand cannabis smoke. I. Urine screening and confirmation results. *J Anal Toxicol*. 2015;39(1):1-12. doi:10.1093/jat/bku116.
17. Herrmann ES, Cone EJ, Mitchell JM, et al. Non-smoker exposure to secondhand cannabis smoke II: Effect of room ventilation on the physiological, subjective, and behavioral/cognitive effects. *Drug Alcohol Depend*. 2015;151:194-202. doi:10.1016/j.drugalcdep.2015.03.019.
18. McCaffrey DF, Pacula RL, Han B, Ellickson P. Marijuana Use and High School Dropout: The Influence of Unobservables. *Health Econ*. 2010;19(11):1281-1299. doi:10.1002/hec.1561.
19. Zwerling C, Ryan J, Orav EJ. The efficacy of preemployment drug screening for marijuana and cocaine in predicting employment outcome. *JAMA*. 1990;264(20):2639-2643.
20. Wang X, Derakhshandeh R, Liu J, et al. One Minute of Marijuana Secondhand Smoke Exposure Substantially Impairs Vascular Endothelial Function. *J Am Heart Assoc*. 2016;5(8). doi:10.1161/JAHA.116.003858.
21. Secades-Villa R, Garcia-Rodríguez O, Jin CJ, Wang S, Blanco C. Probability and predictors of the cannabis gateway effect: a national study. *Int J Drug Policy*. 2015;26(2):135-142. doi:10.1016/j.drugpo.2014.07.011.
22. Levine A, Huang Y, Drisaldi B, et al. Molecular mechanism for a gateway drug: epigenetic changes initiated by nicotine prime gene expression by cocaine. *Sci Transl Med*. 2011;3(107):107ra109. doi:10.1126/scitranslmed.3003062.
23. Panlilio LV, Zanettini C, Barnes C, Solinas M, Goldberg SR. Prior exposure to THC increases the addictive effects of nicotine in rats. *Neuropsychopharmacol Off Publ Am Coll Neuropsychopharmacol*. 2013;38(7):1198-1208. doi:10.1038/npp.2013.16.
24. Cadoni C, Pisanu A, Solinas M, Acquas E, Di Chiara G. Behavioural sensitization after repeated exposure to Delta 9-tetrahydrocannabinol and cross-sensitization with morphine. *Psychopharmacology (Berl)*. 2001;158(3):259-266. doi:10.1007/s002130100875.
25. Hasin DS, Saha TD, Kerridge BT, et al. Prevalence of Marijuana Use Disorders in the United States Between 2001-2002 and 2012-2013. *JAMA Psychiatry*. 2015;72(12):1235-1242. doi:10.1001/jamapsychiatry.2015.1858.
26. Winters KC, Lee C-YS. Likelihood of developing an alcohol and cannabis use disorder during youth: association with recent use and age. *Drug Alcohol Depend*. 2008;92(1-3):239-247. doi:10.1016/j.drugalcdep.2007.08.005.

27. Corsi DJ, Walsh L, Weiss D, et al. Association Between Self-reported Prenatal Cannabis Use and Maternal, Perinatal, and Neonatal Outcomes. *JAMA*. Published online June 18, 2019;322(2):145–152. doi:10.1001/jama.2019.8734

*This publication is available for your use and may be reproduced **in its entirety** without permission from NIDA. Citation of the source is appreciated, using the following language: Source: National Institute on Drug Abuse; National Institutes of Health; U.S. Department of Health and Human Services.*

Research Report

Revised July 2020

Cannabis (Marijuana) Research Report

Table of Contents

Cannabis (Marijuana) Research Report

Letter From the Director

What is marijuana?

What is the scope of cannabis (marijuana) use in the United States?

What are marijuana's effects?

How does marijuana produce its effects?

Does marijuana use affect driving?

Is marijuana addictive?

What are marijuana's long-term effects on the brain?

Is marijuana a gateway drug?

How does marijuana use affect school, work, and social life?

Is there a link between marijuana use and psychiatric disorders?

What are marijuana's effects on lung health?

What are marijuana's effects on other aspects of physical health?

Is marijuana safe and effective as medicine?

What are the effects of secondhand exposure to marijuana smoke?

Can marijuana use during and after pregnancy harm the baby?

Available Treatments for Marijuana Use Disorders

Where can I get further information about marijuana?

References

Cannabis (Marijuana) Research Report

Explores the latest research on marijuana, including the scope of marijuana use in the U.S., health consequences, its effects on everyday activities, and available treatments.

Letter From the Director

Changes in marijuana policies across states legalizing marijuana for medical and/or recreational use suggest that marijuana is gaining greater acceptance in our society. Thus, it is particularly important for people to understand what is known about both the adverse health effects and the potential therapeutic benefits linked to marijuana.

Because marijuana impairs short-term memory and judgment and distorts perception, it can impair performance in school or at work and make it dangerous to drive. It also affects brain systems that are still maturing through young adulthood, so regular use by teens may have negative and long-lasting effects on their cognitive development, putting them at a competitive disadvantage and possibly interfering with their well-being in other ways. Also, contrary to popular belief, marijuana can be addictive, and its use during adolescence may make other forms of problem use or addiction more likely.

Whether smoking or otherwise consuming marijuana has therapeutic benefits that outweigh its health risks is still an open question that science has not resolved. Although many states now permit dispensing marijuana for medicinal purposes and there is mounting anecdotal evidence for the efficacy of marijuana-derived compounds, the U.S. Food and Drug Administration has not approved "medical marijuana." However, safe medicines based on cannabinoid chemicals derived from the marijuana plant have been available for decades and more are being developed.



Photo by NIDA

This Research Report is intended as a useful summary of what the most up-to-date science has to say about marijuana and its effects on those who use it at any age.

Nora D. Volkow, M.D.

Director

National Institute on Drug Abuse

See Also:

- [Message from the NIDA Director - Marijuana's Lasting Effects on the Brain](#), (Archives) (March 2013)

What is marijuana?

Marijuana—also called *weed*, *herb*, *pot*, *grass*, *bud*, *ganja*, *Mary Jane*, and a vast number of other slang terms—is a greenish-gray mixture of the dried flowers of *Cannabis sativa*. Some people smoke marijuana in hand-rolled cigarettes called *joints*; in pipes, water pipes (sometimes called *bongs*), or in *blunts* (marijuana rolled in cigar wraps).¹ Marijuana can also be used to brew tea and, particularly when it is sold or consumed for medicinal purposes (*edibles*) such as brownies, cookies, or candies. Vaporizers are also used to consume marijuana. Stronger forms of marijuana include *sinsemilla* (from concentrated resins containing high doses of marijuana's active *oil*, *waxy budder*, and hard amberlike *shatter*). These resins are used to use them both recreationally and medically.



Image by ©iStock.com/nicooplay

The main *psychoactive*(mind-altering) chemical in marijuana, responsible for most of the intoxicating effects that people seek, is *delta-9-tetrahydrocannabinol* (THC). The chemical is found in resin produced by the leaves and buds primarily of the female cannabis plant. The plant also contains more than 500 other chemicals, including more than 100 compounds that are chemically related to THC, called *cannabinoids*.²

What is the scope of cannabis (marijuana) use in the United States?

All data refer to the United States population.

How many people use cannabis ?

- Among people aged 12 or older in 2020, 17.9% (or about 49.6 million people) reported using cannabis in the past 12 months.

Source: [2020 National Survey on Drug Use and Health](#)

How many young students use cannabis?

- In 2021, an estimated 7.1% of 8th graders, 17.3% of 10th graders, and 30.5% of 12th graders reported using cannabis/hashish in the past 12 months.

Source: [2021 Monitoring the Future Survey](#)

How many people have a cannabis use disorder?

- Among people aged 12 or older in 2020, an estimated 5.1% (or about 14.2 million people) had a cannabis use disorder in the past 12 months.

Source: [2020 National Survey on Drug Use and Health](#)

What are marijuana's effects?

When marijuana is smoked, THC and other chemicals in the plant pass from the lungs into the bloodstream, which rapidly carries them throughout the body to the brain. The person begins to experience effects almost immediately (see "[How does marijuana produce its effects?](#)"). Many people experience a pleasant euphoria and sense of relaxation. Other common effects, which may vary dramatically among different people, include heightened sensory perception (e.g., brighter colors), laughter, altered perception of time, and increased appetite.

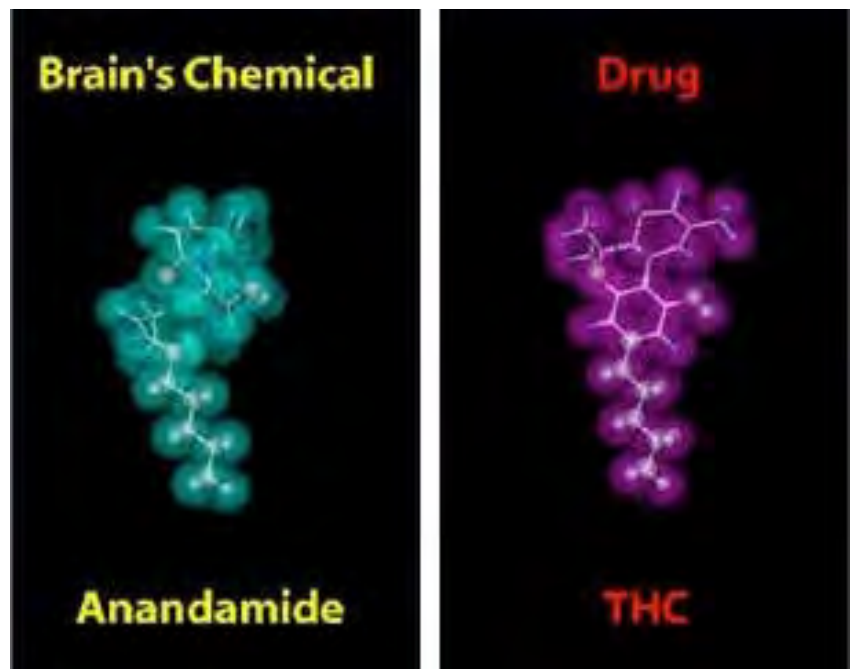
If marijuana is consumed in foods or beverages, these effects are somewhat delayed—usually appearing after 30 minutes to 1 hour—because the drug must first pass through the digestive system. Eating or drinking marijuana delivers significantly less THC into the bloodstream than smoking an

equivalent amount of the plant. Because of the delayed effects, people may inadvertently consume more THC than they intend to.

Pleasant experiences with marijuana are by no means universal. Instead of relaxation and euphoria, some people experience anxiety, fear, distrust, or panic. These effects are more common when a person takes too much, the marijuana has an unexpectedly high potency, or the person is inexperienced. People who have taken large doses of marijuana may experience an acute psychosis, which includes hallucinations, delusions, and a loss of the sense of personal identity. These unpleasant but temporary reactions are distinct from longer-lasting psychotic disorders, such as schizophrenia, that may be associated with the use of marijuana in vulnerable individuals. (See "[Is there a link between marijuana use and psychiatric disorders?](#)")

Although detectable amounts of THC may remain in the body for days or even weeks after use, the noticeable effects of smoked marijuana generally last from 1 to 3 hours, and those of marijuana consumed in food or drink may last for many hours.

How does marijuana produce its effects?



Courtesy of NIDA

THC's chemical structure is similar to the brain chemical *anandamide*. Similarity in structure allows the body to recognize THC and to alter normal brain communication.

THC's chemical structure is similar to the brain chemical anandamide. Similarity in structure allows drugs to be recognized by the body and to alter normal brain communication.

Endogenous cannabinoids such as anandamide (see figure) function as *neurotransmitters* because they send chemical messages between nerve cells (*neurons*) throughout the nervous system. They affect brain areas that influence pleasure, memory, thinking, concentration, movement, coordination, and sensory and time perception. Because of this similarity, THC is able to attach to molecules called *cannabinoid receptors* on neurons in these brain areas and activate them, disrupting various mental and physical functions and causing the effects described earlier. The neural communication network that uses these cannabinoid neurotransmitters, known as the *endocannabinoid system*, plays a critical role in the nervous system's normal functioning, so interfering with it can have profound effects.

For example, THC is able to alter the functioning of the hippocampus (see "[Marijuana, Memory, and the Hippocampus](#)") and orbitofrontal cortex, brain areas that enable a person to form new memories and shift his or her attentional focus. As a result, using marijuana causes impaired thinking and interferes with a person's ability to learn and perform complicated tasks. THC also disrupts functioning of the cerebellum and basal ganglia, brain areas that regulate balance, posture, coordination, and reaction time. This is the reason people who have used marijuana may not be able to drive safely (see "[Does marijuana use affect driving?](#)") and may have problems playing sports or engaging in other physical activities.

People who have taken large doses of the drug may experience an acute psychosis, which includes hallucinations, delusions, and a loss of the sense of personal identity.

THC, acting through cannabinoid receptors, also activates the brain's reward system, which includes regions that govern the response to healthy pleasurable behaviors such as sex and eating. Like most other drugs that people misuse, THC stimulates neurons in the reward system to release the signaling chemical *dopamine* at levels higher than typically observed in response to natural rewarding stimuli. The surge of dopamine "teaches" the brain to repeat the rewarding behavior, helping account for

marijuana's addictive properties.

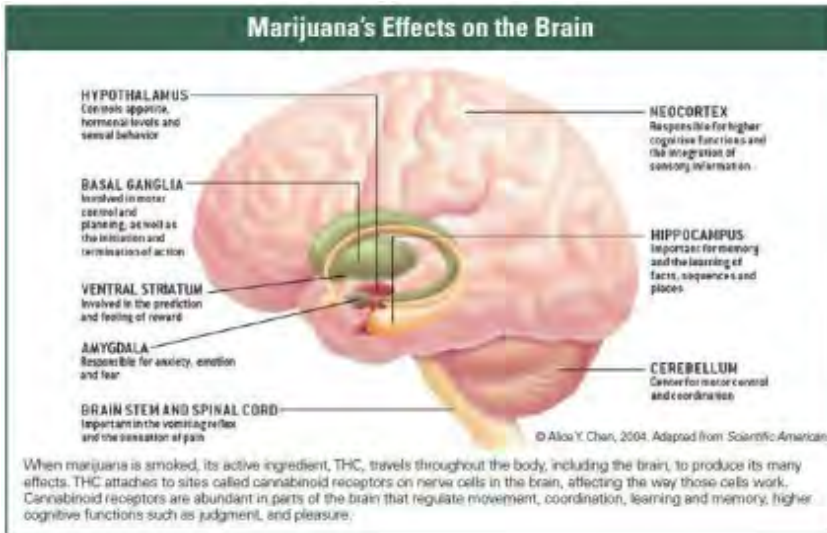


Diagram showing different parts of the brain and describing marijuana's effects on the brain

Does marijuana use affect driving?

Marijuana may impair judgment, motor coordination, and reaction time, and studies have found a direct relationship between blood THC concentration and impaired driving ability.⁷⁻⁹

Marijuana is the illicit drug most frequently found in the blood of drivers involved in vehicle crashes, including fatal ones.¹⁰ Two large European studies found that drivers with marijuana in their blood were roughly twice as likely to be culpable for a fatal crash compared to those with drugs or alcohol.^{11,12} However, the role played by marijuana in crashes can be detected in body fluids for days or even weeks after intoxication and because people frequently combine it with alcohol. Those involved in vehicle crashes with THC in their blood, particularly higher levels, are three to seven times more likely to be responsible for the incident than drivers who had not used drugs or alcohol. The risk associated with marijuana in combination with alcohol appears to be



greater than that for either drug by itself.⁸

Several meta-analyses of multiple studies found that the risk of being involved in a crash significantly increased after marijuana use¹³—in a few cases, the risk doubled or more than doubled.^{14–16} However, a large case-control study conducted by the National Highway Traffic Safety Administration found no significant increased crash risk attributable to cannabis after controlling for drivers' age, gender, race, and presence of alcohol.¹⁷

Is marijuana addictive?

Marijuana use can lead to the development of problem use, known as a marijuana use disorder, which takes the form of addiction in severe cases. Recent data suggest that 30% of those who use marijuana may have some degree of marijuana use disorder.¹⁸ People who begin using marijuana before the age of 18 are four to seven times more likely to develop a marijuana use disorder than adults.¹⁹

Marijuana use disorders are often associated with *dependence*—in which a person feels withdrawal symptoms when not taking the drug. People who use marijuana frequently often report irritability, mood and sleep difficulties, decreased appetite, cravings, restlessness, and/or various forms of physical discomfort that peak within the first week after quitting and last up to 2 weeks.^{20,21} Marijuana dependence occurs when the brain adapts to large amounts of the drug by reducing production of and sensitivity to its own endocannabinoid neurotransmitters.^{22,23}

Marijuana use disorder becomes addiction when the person cannot stop using the drug even though it interferes with many aspects of his or her life. Estimates of the number of people addicted to marijuana are controversial, in part because epidemiological studies of substance use often use dependence as a proxy for addiction even though it is possible to be dependent without being addicted. Those studies suggest that 9% of people who use marijuana will become dependent on it,^{24,25} rising to about 17% in those who start using in their teens.^{26,27}

In 2015, about 4.0 million people in the United States met the diagnostic criteria for a marijuana use disorder;³ 138,000 voluntarily sought treatment for their marijuana use.²⁸

Rising Potency

Marijuana potency, as detected in confiscated samples, has steadily increased over the past few decades. In the early 1990s, the average THC content in confiscated marijuana samples was less than 4%.² In 2018, it was more than 15%.²⁹ Marijuana concentrates can have much higher levels of THC (see [Marijuana Concentrates DrugFacts](#)). The increasing potency of marijuana, combined with the use of high-THC concentrates, raises concerns that the consequences of marijuana use today could be worse than in the past, particularly among those who are new to marijuana use and in young people, whose brains are still developing (see "[What are marijuana's long-term effects on the brain?](#)").

Researchers do not yet know the full extent of the consequences when the body and brain (especially the developing brain) are exposed to high concentrations of THC or whether the recent increases in emergency department visits by people testing positive for marijuana are related to rising potency. The extent to which people adjust for increased potency by using less or by smoking it differently is also unknown. Recent studies suggest that experienced people may adjust the amount they smoke and how much they inhale based on the believed strength of the marijuana they are using, but they are not able to fully compensate for variations in potency.^{30,31}

What are marijuana's long-term effects on the brain?

Substantial evidence from animal research and a growing number of studies in humans indicate that marijuana exposure during development can cause long-term or possibly permanent adverse changes in the brain. Rats exposed to THC before birth, soon after birth, or during adolescence show notable problems with specific learning and memory tasks later in life.³²⁻³⁴ Cognitive impairments in adult rats exposed to THC during adolescence are associated with structural and functional changes in the hippocampus.³⁵⁻³⁷ Studies in rats also show that adolescent exposure to THC is associated with an altered reward system, increasing the likelihood that an animal will self-administer other drugs (e.g., heroin) when given an opportunity (see "[Is marijuana a gateway drug?](#)").

Imaging studies of marijuana's impact on brain structure in humans have shown conflicting results. Some studies suggest regular marijuana use in adolescence is associated with altered connectivity and reduced volume of specific brain regions involved in a broad range of executive functions such as memory, learning, and impulse control compared to people who do not use.^{38,39} Other studies have not found significant structural differences between the brains of people who do and do not use the drug.⁴⁰

Several studies, including two large longitudinal studies, suggest that marijuana use can cause functional impairment in cognitive abilities but that the degree and/or duration of the impairment depends on the age when a person began using and how much and how long he or she used.⁴¹

Among nearly 4,000 young adults in the Coronary Artery Risk Development in Young Adults study tracked over a 25-year period until mid-adulthood, cumulative lifetime exposure to marijuana was associated with lower scores on a test of verbal memory but did not affect other cognitive abilities such as processing speed or executive function. The effect was sizable and significant even after eliminating those involved with current use and after adjusting for confounding factors such as demographic factors, other drug and alcohol use, and other psychiatric conditions such as depression.⁴²

Some studies have also linked marijuana use to declines in IQ, especially when use starts in adolescence and leads to persistent cannabis use disorder into adulthood. However, not all of the studies on the link between marijuana and IQ have reached the same conclusion, and it is difficult to prove that marijuana causes a decline in IQ when there are multiple factors that can influence the results of such studies, such as genetics, family environment, age of first use, frequency of use, having a cannabis use disorder, duration of use, and duration of the study. Key research in this area to date is described below.

A large longitudinal study in New Zealand found that persistent marijuana use disorder with frequent use starting in adolescence was associated with a loss of an average of 6 or up to 8 IQ points measured in mid-adulthood.⁴³ Those who used marijuana heavily as teenagers and quit using as adults did not recover the lost IQ points. People who only began using marijuana heavily in adulthood did not lose IQ points. Two shorter-duration prospective longitudinal twin studies found that youth who used marijuana showed significant declines in verbal ability (equivalent to 4 IQ points) and general knowledge between the preteen years (ages 9 to 12, before use) and late adolescence/early

adulthood (ages 17 to 20); however those who went on to use marijuana at older ages already had lower scores on these measures at the start of the study, before they started using the drug. Also, no predictable difference was found between twins when one used marijuana and one did not.⁴⁴

More research will be needed to answer definitively whether marijuana use causes long-term IQ losses and whether factors that weren't measured in the prior research, such as the increasing amounts of THC in cannabis and the emergence of new cannabis products, are relevant.

Also, the ability to draw definitive conclusions about marijuana's long-term impact on the human brain from past studies is often limited by the fact that study participants use multiple substances, and there is often limited data about the participants' health or mental functioning prior to the study. Over the next decade, the National Institutes of Health is funding the [Adolescent Brain Cognitive Development \(ABCD\) study](#)—a major longitudinal study that will track a large sample of young Americans from late childhood (before first use of drugs) to early adulthood. The study will use neuroimaging and other advanced tools to clarify precisely how and to what extent marijuana and other substances, alone and in combination, affect adolescent brain development.

Marijuana, Memory, and the Hippocampus

Distribution of cannabinoid receptors in the rat brain. Brain image reveals high levels (shown in orange and yellow) of cannabinoid receptors in many areas, including the cortex, hippocampus, cerebellum, and nucleus accumbens (ventral striatum).

Memory impairment from marijuana use occurs because THC alters how the hippocampus, a brain area responsible for memory formation, processes information.

Most of the evidence supporting this assertion comes from animal studies. For example, rats exposed to THC *in utero*, soon after birth, or during adolescence, show notable problems with specific learning/memory tasks later in life. Moreover, cognitive impairment in adult rats is associated with structural and functional changes in the



Image by NIDA

hippocampus from THC exposure during adolescence.

As people age, they lose neurons in the hippocampus, which decreases their ability to learn new information. Chronic THC exposure may hasten age-related loss of hippocampal neurons. In one study, rats exposed to THC every day for 8 months (approximately 30% of their lifespan) showed a level of nerve cell loss at 11 to 12 months of age that equaled that of unexposed animals twice their age.

Is marijuana a gateway drug?

Some research suggests that marijuana use is likely to precede use of other licit and illicit substances⁴⁵ and the development of addiction to other substances. For instance, a study using longitudinal data from the National Epidemiological Study of Alcohol Use and Related Disorders found that adults who reported marijuana use during the first wave of the survey were more likely than adults who did not use marijuana to develop an alcohol use disorder within 3 years; people who used marijuana and already had an alcohol use disorder at the outset were at greater risk of their alcohol use disorder worsening.⁴⁶ Marijuana use is also linked to other substance use disorders including nicotine addiction.

Early exposure to cannabinoids in adolescent rodents decreases the reactivity of brain dopamine reward centers later in adulthood.⁴⁷ To the extent that these findings generalize to humans, this could help explain the increased vulnerability for addiction to other substances of misuse later in life that most epidemiological studies have reported for people who begin marijuana use early in life.⁴⁸ It is also consistent with animal experiments showing THC's ability to "prime" the brain for enhanced responses to other drugs.⁴⁹ For example, rats previously administered THC show heightened behavioral response not only when further exposed to THC but also when exposed to other drugs such as morphine—a phenomenon called *cross-sensitization*.⁵⁰

These findings are consistent with the idea of marijuana as a "gateway drug." However, the majority of people who use marijuana do not go on to use other, "harder" substances. Also, cross-sensitization is not unique to marijuana. Alcohol and nicotine also prime the brain for a heightened response to other

drugs⁵¹ and are, like marijuana, also typically used before a person progresses to other, more harmful substances.

It is important to note that other factors besides biological mechanisms, such as a person's social environment, are also critical in a person's risk for drug use. An alternative to the gateway-drug hypothesis is that people who are more vulnerable to drug-taking are simply more likely to start with readily available substances such as marijuana, tobacco, or alcohol, and their subsequent social interactions with others who use drugs increases their chances of trying other drugs. Further research is needed to explore this question.

How does marijuana use affect school, work, and social life?



Research has shown that

Image by ©iStock.com/AntonioGuillem

marijuana's negative effects on attention, memory, and learning

can last for days or weeks after the acute effects of the drug wear off, depending on the person's history with the drug.⁵² Consequently, someone who smokes marijuana daily may be functioning at a reduced intellectual level most or all of the time. Considerable evidence suggests that students who smoke marijuana have poorer educational outcomes than their nonsmoking peers. For example, a review of 48 relevant studies found marijuana use to be associated with reduced educational attainment (i.e., reduced chances of graduating).⁵³ A recent analysis using data from three large studies in Australia and New Zealand found that adolescents who used marijuana regularly were significantly less likely than their non-using peers to finish high school or obtain a degree. They also had a much higher chance of developing dependence, using other drugs, and attempting suicide.⁵⁴ Several studies have also linked heavy marijuana use to lower income, greater welfare dependence, unemployment, criminal behavior, and lower life satisfaction.^{55,56}

To what degree marijuana use is directly causal in these associations remains an open question requiring further research. It is possible that other factors independently predispose people to both marijuana use and various negative life outcomes such as school dropout.⁵⁷ That said, people report a perceived influence of their marijuana use on poor outcomes on a variety of life satisfaction and achievement measures. One study, for example, compared people involved with current and former long-term, heavy use of marijuana with a control group who reported smoking marijuana at least once in their lives but not more than 50 times.⁵⁸ All participants had similar education and income backgrounds, but significant differences were found in their educational attainment: Fewer of those who engaged in heavy cannabis use completed college, and more had yearly household incomes of less than \$30,000. When asked how marijuana affected their cognitive abilities, career achievements, social lives, and physical and mental health, the majority of those who used heavily reported that marijuana had negative effects in all these areas of their lives.

Studies have also suggested specific links between marijuana use and adverse consequences in the workplace, such as increased risk for injury or accidents.⁵⁹ One study among postal workers found that employees who tested positive for marijuana on a pre-employment urine drug test had 55% more industrial accidents, 85% more injuries, and 75% greater absenteeism compared with those who tested negative for marijuana use.⁶⁰

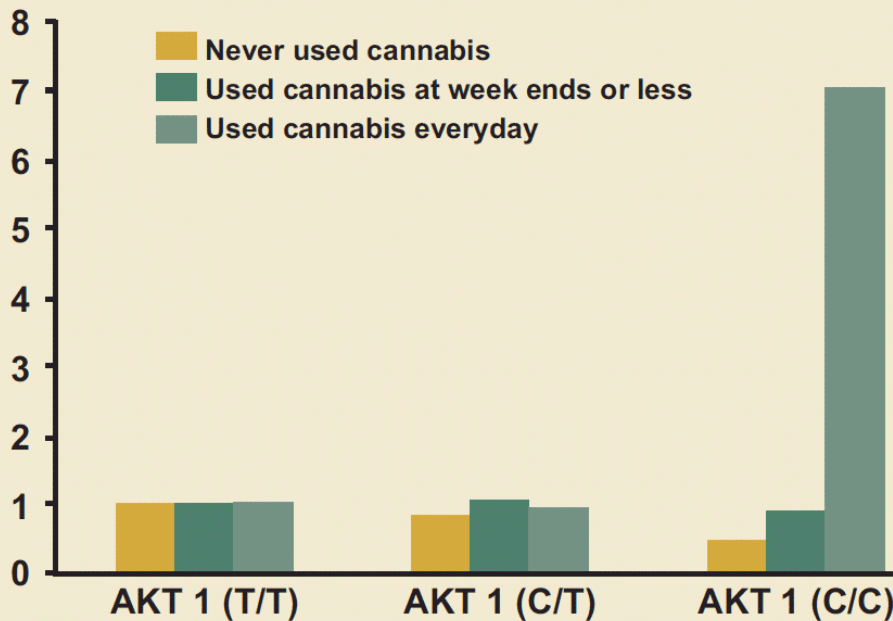
Is there a link between marijuana use and psychiatric disorders?

Several studies have linked marijuana use to increased risk for psychiatric disorders, including psychosis (schizophrenia), depression, anxiety, and substance use disorders, but whether and to what extent it actually causes these conditions is not always easy to determine.³² Recent research suggests that smoking high-potency marijuana every day could increase the chances of developing psychosis by nearly five times compared to people who have never used marijuana.¹¹³ The amount of drug used, the age at first use, and genetic vulnerability have all been shown to influence this relationship. The strongest evidence to date concerns links between marijuana use and psychiatric disorders in those with a preexisting genetic or other vulnerability.⁶¹

Research using longitudinal data from the National Epidemiological Survey on Alcohol and Related Conditions examined associations between marijuana use, mood and anxiety disorders, and substance use disorders. After adjusting for various confounding factors, no association between marijuana use and mood and anxiety disorders was found. The only significant associations were increased risk of alcohol use disorders, nicotine dependence, marijuana use disorder, and other drug use disorders.⁶²

Recent research (see "[AKT1 Gene Variations and Psychosis](#)") has found that people who use marijuana and carry a specific variant of the *AKT1* gene, which codes for an enzyme that affects dopamine signaling in the *striatum*, are at increased risk of developing psychosis. The striatum is an area of the brain that becomes activated and flooded with dopamine when certain stimuli are present. One study found that the risk of psychosis among those with this variant was seven times higher for those who used marijuana daily compared with those who used it infrequently or used none at all.⁶³

AKT1 Gene Variations and Psychosis

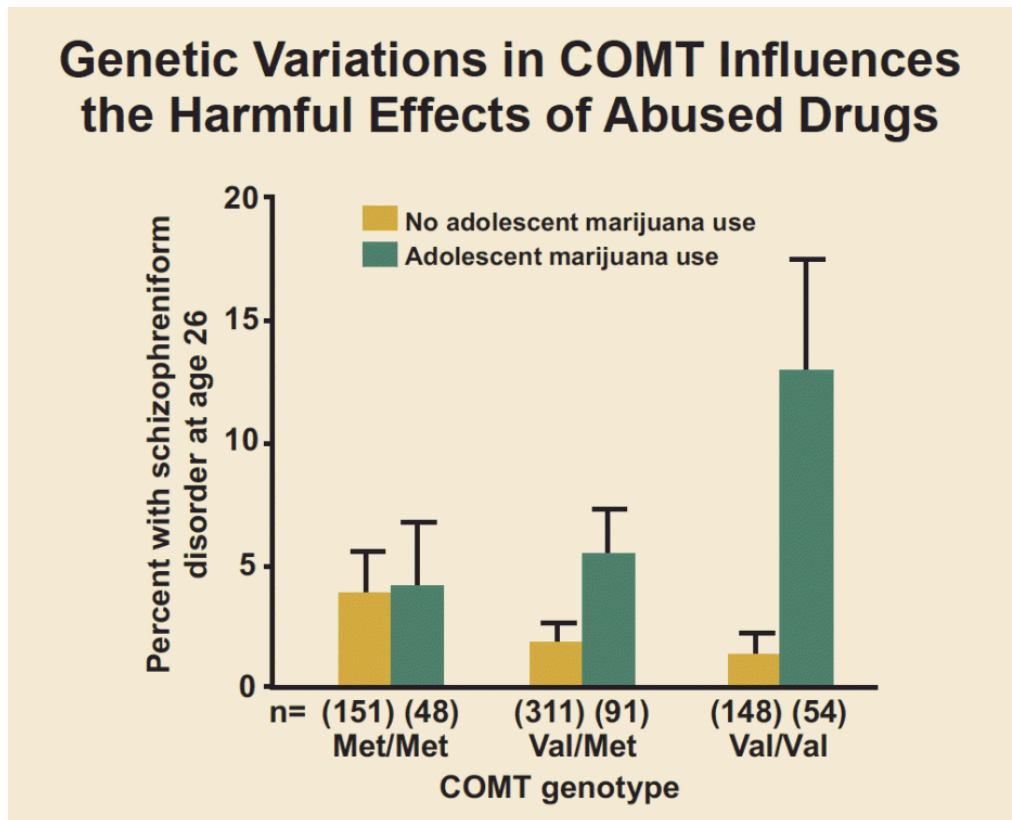


Source: Di Forti et al. Biol Psychiatry. 2012.

Whether adolescent marijuana use can contribute to developing psychosis later in adulthood appears to depend on whether a person already has a genetically based vulnerability to the disorder. The AKT1 gene governs an enzyme that affects brain signaling involving the neurotransmitter dopamine. Altered dopamine signaling is known to be involved in schizophrenia. AKT1 can take one of three forms in a specific region of the gene implicated in susceptibility to schizophrenia: T/T, C/T, and C/C. Those who use marijuana daily (green bars) with the C/C variant have a seven times higher risk of developing psychosis than those who use it infrequently or use none at all. The risk for psychosis among those with the T/T variant was unaffected by whether they used marijuana.

Another study found an increased risk of psychosis among adults who had used marijuana in adolescence and also carried a specific variant of the gene for *catechol-O-methyltransferase* (COMT), an enzyme that degrades neurotransmitters such as dopamine and norepinephrine⁶⁴ (see "[Genetic Variations in COMT Influences the Harmful Effects of Abused Drugs](#)"). Marijuana use has also been shown to worsen the course of illness in patients who already have schizophrenia. As mentioned

previously, marijuana can produce an acute psychotic reaction in non-schizophrenic people who use marijuana, especially at high doses, although this fades as the drug wears off.



Source: Di Forti et al. Biol Psychiatry. 2012.

The influence of adolescent marijuana use on adult psychosis is affected by genetic variables. This figure shows that variations in a gene can affect the likelihood of developing psychosis in adulthood following exposure to cannabis in adolescence. The COMT gene governs an enzyme that breaks down dopamine, a brain chemical involved in schizophrenia. It comes in two forms: "Met" and "Val." Individuals with one or two copies of the Val variant have a higher risk of developing schizophrenic-type disorders if they used cannabis during adolescence (dark bars). Those with only the Met variant were unaffected by cannabis use.

Inconsistent and modest associations have been reported between marijuana use and suicidal thoughts and attempted suicide among teens.^{65,66} Marijuana has also been associated with an

amotivational syndrome, defined as a diminished or absent drive to engage in typically rewarding activities. Because of the role of the endocannabinoid system in regulating mood and reward, it has been hypothesized that brain changes resulting from early use of marijuana may underlie these associations, but more research is needed to verify that such links exist and better understand them.

Adverse Consequences of Marijuana Use

Acute (present during intoxication)

- Impaired short-term memory
- Impaired attention, judgment, and other cognitive functions
- Impaired coordination and balance
- Increased heart rate
- Anxiety, paranoia
- Psychosis (uncommon)

Persistent (lasting longer than intoxication, but may not be permanent)

- Impaired learning and coordination
- Sleep problems

Long-term (cumulative effects of repeated use)

- Potential for marijuana addiction
- Impairments in learning and memory with potential loss of IQ*
- Increased risk of chronic cough, bronchitis
- Increased risk of other drug and alcohol use disorders
- Increased risk of schizophrenia in people with genetic vulnerability**



Photo by @gettyimages.com/Fuse

**Loss of IQ among individuals with persistent marijuana use disorder who began using heavily during adolescence*

***These are often reported co-occurring symptoms/disorders with chronic marijuana use. However, research has not yet determined whether marijuana is causal or just associated with these mental problems.*

What are marijuana's effects on lung health?

Like tobacco smoke, marijuana smoke is an irritant to the throat and lungs and can cause a heavy cough during use. It also contains levels of volatile chemicals and tar that are similar to tobacco smoke, raising concerns about risk for cancer and lung disease.⁶⁷

Marijuana smoking is associated with large airway inflammation, increased airway resistance, and lung hyperinflation, and those who smoke marijuana regularly report more symptoms of chronic bronchitis than those who do not smoke.^{67,68} One study found that people who frequently smoke marijuana had more outpatient medical visits for respiratory problems than those who do not smoke.⁶⁹ Some case studies have suggested that, because of THC's immune-suppressing effects, smoking marijuana might increase susceptibility to lung infections, such as pneumonia, in people with immune deficiencies; however, a large AIDS cohort study did not confirm such an association.⁶⁷ Smoking marijuana may also reduce the respiratory system's immune response, increasing the likelihood of the person acquiring respiratory infections, including pneumonia.⁶⁸ Animal and human studies have not found that marijuana increases risk for emphysema.⁶⁷

Reports of Deaths Related to Vaping Marijuana

The Food and Drug Administration has [alerted](#) the public to hundreds of reports of serious lung illnesses associated with vaping, including several deaths. They are working with the [Centers for Disease Control and Prevention \(CDC\)](#) to investigate the cause of these illnesses. Many of the

suspect products tested by the states or federal health officials have been identified as vaping products containing THC, the main psychotropic ingredient in marijuana. Some of the patients reported a mixture of THC and nicotine; and some reported vaping nicotine alone. No one substance has been identified in all of the samples tested, and it is unclear if the illnesses are related to one single compound. Until more details are known, FDA officials have warned people not to use any vaping products bought on the street, and they warn against modifying any products purchased in stores. They are also asking people and health professionals to [report](#) any adverse effects. The CDC has posted an [information page](#) for consumers.

Whether smoking marijuana causes lung cancer, as cigarette smoking does, remains an open question.^{67,70} Marijuana smoke contains carcinogenic combustion products, including about 50% more benzoprene and 75% more benzanthracene (and more phenols, vinyl chlorides, nitrosamines, reactive oxygen species) than cigarette smoke.⁶⁷ Because of how it is typically smoked (deeper inhale, held for longer),⁷¹ marijuana smoking leads to four times the deposition of tar compared to cigarette smoking. However, while a few small, uncontrolled studies have suggested that heavy, regular marijuana smoking could increase risk for respiratory cancers, well-designed population studies have failed to find an increased risk of lung cancer associated with marijuana use.⁶⁷

One complexity in comparing the lung-health risks of marijuana and tobacco concerns the very different ways the two substances are used. While people who smoke marijuana often inhale more deeply and hold the smoke in their lungs for a longer duration than is typical with cigarettes, marijuana's effects last longer, so people who use marijuana may smoke less frequently than those who smoke cigarettes.

Additionally, the fact that many people use both marijuana and tobacco makes determining marijuana's precise contribution to lung cancer risk, if any, difficult to establish. Cell culture and animal studies have also suggested THC and CBD may have antitumor effects, and this has been proposed as one reason why stronger expected associations are not seen between marijuana use and lung cancer, but more research is needed on this question.⁶⁷

What are marijuana's effects on other aspects of physical health?

Within a few minutes after inhaling marijuana smoke, a person's heart rate speeds up, the breathing passages relax and become enlarged, and blood vessels in the eyes expand, making the eyes look bloodshot. The heart rate—normally 70 to 80 beats per minute—may increase by 20 to 50 beats per minute or may even double in some cases. Taking other drugs with marijuana can amplify this effect.

Limited evidence suggests that a person's risk of heart attack during the first hour after smoking marijuana is nearly five times his or her usual risk.⁷² This observation could be partly explained by marijuana raising blood pressure (in some cases) and heart rate and reducing the blood's capacity to carry oxygen.⁷³ Marijuana may also cause *orthostatic hypotension* (head rush or dizziness on standing up), possibly raising danger from fainting and falls. Tolerance to some cardiovascular effects often develops with repeated exposure.⁷⁴ These health effects need to be examined more closely, particularly given the increasing use of "medical marijuana" by people with health issues and older adults who may have increased baseline vulnerability due to age-related cardiovascular risk factors (see "[Is marijuana safe and effective as medicine?](#)").

A few studies have shown a clear link between marijuana use in adolescence and increased risk for an aggressive form of testicular cancer (nonseminomatous testicular germ cell tumor) that predominantly strikes young adult males.^{75,76} The early onset of testicular cancers compared to lung and most other cancers indicates that, whatever the nature of marijuana's contribution, it may accumulate over just a few years of use.

Studies have shown that in rare cases, chronic use of marijuana can lead to Cannabinoid Hyperemesis Syndrome—a condition marked by recurrent bouts of severe nausea, vomiting, and dehydration. This syndrome has been found to occur in persons under 50 years of age and with a long history of marijuana use. Cannabinoid Hyperemesis Syndrome can lead sufferers to make frequent trips to the emergency room, but may be resolved when a person stops using marijuana.⁷⁷

Is marijuana safe and effective as medicine?

The potential medicinal properties of marijuana and its components have been the subject of research and heated debate for decades. THC itself has proven medical benefits in particular formulations. The U.S. Food and Drug Administration (FDA) has approved THC-based medications, dronabinol (Marinol[®]) and nabilone (Cesamet[®]), prescribed in pill form for the treatment of nausea in patients undergoing cancer chemotherapy and to stimulate appetite in patients with wasting syndrome due to AIDS.

In addition, several other marijuana-based medications have been approved or are undergoing clinical trials. Nabiximols (Sativex[®]), a mouth spray that is currently available in the United Kingdom, Canada, and several European countries for treating the spasticity and neuropathic pain that may accompany multiple sclerosis, combines THC with another chemical found in marijuana called cannabidiol (CBD).

The FDA also approved a CBD-based liquid medication called Epidiolex[®] for the treatment of two forms of severe childhood epilepsy, Dravet syndrome and Lennox-Gastaut syndrome. It's being delivered to patients in a reliable dosage form and through a reproducible route of delivery to ensure that patients derive the anticipated benefits. CBD does not have the rewarding properties of THC.

Researchers generally consider medications like these, which use purified chemicals derived from or based on those in the marijuana plant, to be more promising therapeutically than use of the whole marijuana plant or its crude extracts. Development of drugs from botanicals such as the marijuana plant poses numerous challenges. Botanicals may contain hundreds of unknown, active chemicals, and it can be difficult to develop a product with accurate and consistent doses of these chemicals. Use of marijuana as medicine also poses other problems such as the adverse health effects of smoking and THC-induced cognitive impairment. Nevertheless, a growing number of states have legalized dispensing of marijuana or its extracts to people with a range of medical conditions.

An additional concern with "medical marijuana" is that little is known about the long-term impact of its use by people with health- and/or age-related vulnerabilities—such as older adults or people with cancer, AIDS, cardiovascular disease, multiple sclerosis, or other neurodegenerative diseases. Further research will be needed to determine whether people whose health has been compromised by disease or its treatment (e.g., chemotherapy) are at greater risk for adverse health outcomes from marijuana use.

Medical Marijuana Laws and Prescription Opioid Use Outcomes

A new study underscores the need for additional research on the effect of medical marijuana laws on opioid overdose deaths and cautions against drawing a causal connection between the two. Early research suggested that there may be a relationship between the availability of medical marijuana and opioid analgesic overdose mortality. In particular, a NIDA-funded study published in 2014 found that from 1999 to 2010, states with medical cannabis laws experienced slower rates of increase in opioid analgesic overdose death rates compared to states without such laws.⁷⁸

A 2019 analysis, also funded by NIDA, re-examined this relationship using data through 2017. Similar to the findings reported previously, this research team found that opioid overdose mortality rates between 1999-2010 in states allowing medical marijuana use were 21% lower than expected. When the analysis was extended through 2017, however, they found that the trend reversed, such that states with medical cannabis laws experienced an overdose death rate 22.7% higher than expected.⁷⁹ The investigators uncovered no evidence that either broader cannabis laws (those allowing recreational use) or more restrictive laws (those only permitting the use of marijuana with low tetrahydrocannabinol concentrations) were associated with changes in opioid overdose mortality rates.

These data, therefore, do not support the interpretation that access to cannabis reduces opioid overdose. Indeed, the authors note that neither study provides evidence of a causal relationship between marijuana access and opioid overdose deaths. Rather, they suggest that the associations are likely due to factors the researchers did not measure, and they caution against drawing conclusions on an individual level from ecological (population-level) data. Research is still needed on the potential medical benefits of cannabis or cannabinoids.

What are the effects of secondhand exposure to marijuana smoke?

People often ask about the possible psychoactive effect of exposure to secondhand marijuana smoke and whether a person who has inhaled secondhand marijuana smoke could fail a drug test.

Researchers measured the amount of THC in the blood of people who do not smoke marijuana and had spent 3 hours in a well-ventilated space with people casually smoking marijuana; THC was present in the blood of the nonsmoking participants, but the amount was well below the level needed to fail a drug test. Another study that varied the levels of ventilation and the potency of the marijuana found that some nonsmoking participants exposed for an hour to high-THC marijuana (11.3% THC concentration) in an unventilated room showed positive urine assays in the hours directly following exposure⁸⁰; a follow-up study showed that nonsmoking people in a confined space with people smoking high-THC marijuana reported mild subjective effects of the drug—a "contact high"—and displayed mild impairments on performance in motor tasks.⁸¹

The known health risks of secondhand exposure to cigarette smoke—to the heart or lungs, for instance—raise questions about whether secondhand exposure to marijuana smoke poses similar health risks. At this point, very little research on this question has been conducted. A 2016 study in rats found that secondhand exposure to marijuana smoke affected a measure of blood vessel function as much as secondhand tobacco smoke, and the effects lasted longer.⁸² One minute of exposure to secondhand marijuana smoke impaired flow-mediated dilation (the extent to which arteries enlarge in response to increased blood flow) of the femoral artery that lasted for at least 90 minutes; impairment from 1 minute of secondhand tobacco exposure was recovered within 30 minutes. The effects of marijuana smoke were independent of THC concentration; i.e., when THC was removed, the impairment was still present. This research has not yet been conducted with human subjects, but the toxins and tar levels known to be present in marijuana smoke (see "[What are marijuana's effects on lung health?](#)") raise concerns about exposure among vulnerable populations, such as children and people with asthma.

Can marijuana use during and after pregnancy harm the baby?

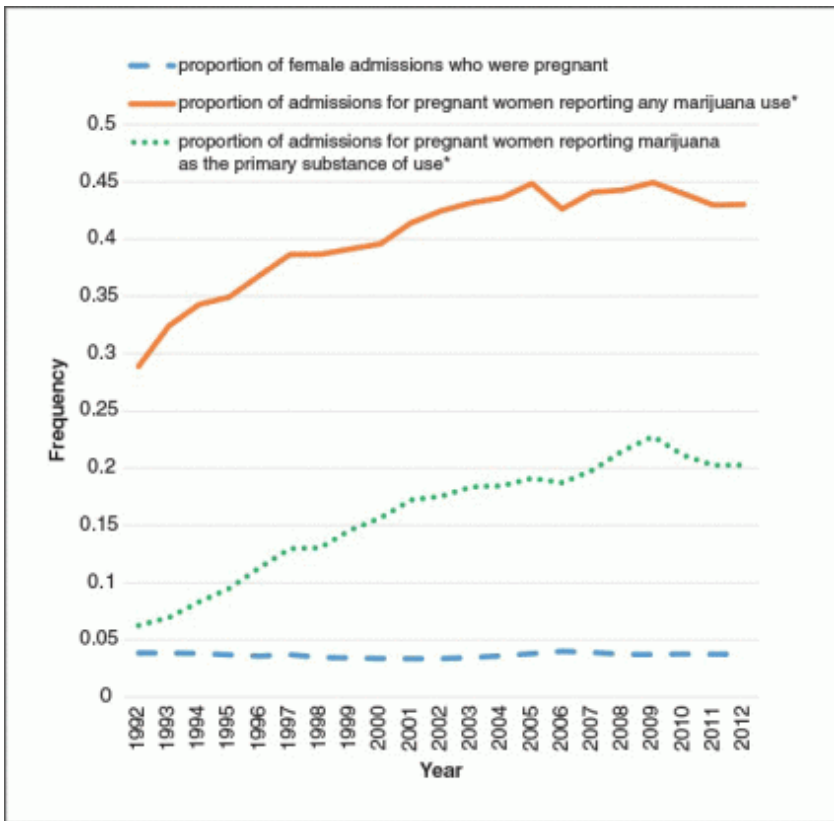


More research is needed on how marijuana use during pregnancy could impact the health and

Photo by ©Thinkstock.com/Creatas Images

development of infants, given changing policies about access to marijuana, as well as significant increases over the last decade in the number of pregnant women seeking substance use disorder treatment for marijuana use.⁸³ One study found that about 20% of pregnant women 24-years-old and younger screened positive for marijuana. However, this study also found that women were about twice as likely to screen positive for marijuana use via a drug test than they state in self-reported measures. This suggests that self-reported rates of marijuana use in pregnant females may not be an accurate measure of marijuana use.⁸⁴ Additionally, in one study of dispensaries, nonmedical personnel at marijuana dispensaries were recommending marijuana to pregnant women for nausea, but medical experts warn against it.

There is no human research connecting marijuana use to the chance of miscarriage,^{85,86} although animal studies indicate that the risk for miscarriage increases if marijuana is used early in pregnancy.⁸⁷ Some associations have been found between marijuana use during pregnancy and future developmental and hyperactivity disorders in children.⁸⁸⁻⁹¹ Evidence is mixed as to whether marijuana use by pregnant women is associated with low birth weight⁹²⁻⁹⁶ or premature birth,⁹⁵ although long-term use may elevate these risks.⁹⁴ Research has shown that pregnant women who use marijuana have a 2.3 times greater risk of stillbirth.⁹⁷ Given the potential of marijuana to negatively impact the developing brain, the American College of Obstetricians and Gynecologists recommends that obstetrician-gynecologists counsel women against using marijuana while trying to get pregnant, during pregnancy, and while they are breastfeeding.⁹⁸ It is important to note that despite the growing popularity of using marijuana in vaping devices, the [Food and Drug Administration](#) recommends that pregnant women should not use any vaping product, regardless of the substance.



Source: Martin et al., 2015

Recent Trends in Treatment Admissions for Marijuana Use During Pregnancy

Some women report using marijuana to treat severe nausea associated with their pregnancy;^{99,100} however, there is no research confirming that this is a safe practice, and it is generally not recommended. Women considering using medical marijuana while pregnant should not do so without checking with their health care providers. Animal studies have shown that moderate concentrations of THC, when administered to mothers while pregnant or nursing, could have long-lasting effects on the child, including increasing stress responsivity and abnormal patterns of social interactions.¹⁰¹ Animal studies also show learning deficits in prenatally exposed individuals.^{33,102}

Human research has shown that some babies born to women who used marijuana during their pregnancies display altered responses to visual stimuli, increased trembling, and a high-pitched cry,¹⁰³ which could indicate problems with neurological development.¹⁰⁴ In school, marijuana-exposed children are more likely to show gaps in problem-solving skills, memory,¹⁰⁵ and the ability to remain

attentive.¹⁰⁶ More research is needed, however, to disentangle marijuana-specific effects from those of other environmental factors that could be associated with a mother's marijuana use, such as an impoverished home environment or the mother's use of other drugs.⁹⁶ Prenatal marijuana exposure is also associated with an increased likelihood of a person using marijuana as a young adult, even when other factors that influence drug use are considered.¹⁰⁷ More information on marijuana use during pregnancy can be found in the NIDA's [Substance Use in Women Research Report](#).

Very little is known about marijuana use and breastfeeding. One study suggests that moderate amounts of THC find their way into breast milk when a nursing mother uses marijuana.¹⁰⁸ Some evidence shows that exposure to THC through breast milk in the first month of life could result in decreased motor development at 1 year of age.¹⁰⁹ There have been no studies to determine if exposure to THC during nursing is linked to effects later in the child's life. With regular use, THC can accumulate in human breast milk to high concentrations.⁹² Because a baby's brain is still forming, THC consumed in breast milk could affect brain development. Given all these uncertainties, nursing mothers are discouraged from using marijuana.^{98,110} New mothers using medical marijuana should be vigilant about coordinating care between the doctor recommending their marijuana use and the pediatrician caring for their baby.

Available Treatments for Marijuana Use Disorders

Marijuana use disorders appear to be very similar to other substance use disorders, although the long-term clinical outcomes may be less severe. On average, adults seeking treatment for marijuana use disorders have used marijuana nearly every day for more than 10 years and have attempted to quit more than six times.¹¹¹ People with marijuana use disorders, especially adolescents, often also suffer from other [psychiatric disorders](#) (*comorbidity*).¹¹² They may also use or be addicted to other substances, such as cocaine or alcohol. Available studies indicate that effectively treating the mental health disorder with standard treatments involving medications and behavioral therapies may help reduce marijuana use, particularly among those involved with heavy use and those with more chronic mental disorders. The following behavioral treatments have shown promise:

- **Cognitive-behavioral therapy:** A form of psychotherapy that teaches people strategies to identify and correct problematic behaviors in order to enhance self-control, stop drug use, and address a

range of other problems that often co-occur with them.

- **Contingency management:** A therapeutic management approach based on frequent monitoring of the target behavior and the provision (or removal) of tangible, positive rewards when the target behavior occurs (or does not).
- **Motivational enhancement therapy:** A systematic form of intervention designed to produce rapid, internally motivated change; the therapy does not attempt to treat the person, but rather mobilize his or her own internal resources for change and engagement in treatment.

Currently, the FDA has not approved any medications for the treatment of marijuana use disorder, but research is active in this area. Because sleep problems feature prominently in marijuana withdrawal, some studies are examining the effectiveness of medications that aid in sleep. Medications that have shown promise in early studies or small clinical trials include the sleep aid zolpidem (Ambien[®]), an anti-anxiety/anti-stress medication called buspirone (BuSpar[®]), and an anti-epileptic drug called gabapentin (Horizant[®], Neurontin[®]) that may improve sleep and, possibly, executive function. Other agents being studied include the nutritional supplement N-acetylcysteine and chemicals called FAAH inhibitors, which may reduce withdrawal by inhibiting the breakdown of the body's own cannabinoids. Future directions include the study of substances called *allosteric modulators* that interact with cannabinoid receptors to inhibit THC's rewarding effects.

Where can I get further information about marijuana?

The NIDA website includes:

- information about drugs and related health consequences
- NIDA publications, news, and events
- resources for health care professionals
- funding information (including program announcements and deadlines)
- international activities
- links to related websites (access to websites of many other organizations in the field)
- information in Spanish (en español)

NIDA webpages

- nida.nih.gov/drugs-abuse/marijuana
- nida.nih.gov/related-topics/hiv-aids
- researchstudies.drugabuse.gov
- irp.drugabuse.gov

For physician information

- NIDAMED: nida.nih.gov/nidamed

Other websites

Information about marijuana is also available through the following websites:

- [Substance Abuse and Mental Health Services Administration](#) (SAMHSA)
- [Drug Enforcement Administration](#) (DEA)
- [Monitoring the Future](#)
- [Partnership for Drug-Free Kids](#)

*This publication is available for your use and may be reproduced **in its entirety** without permission from NIDA. Citation of the source is appreciated, using the following language: Source: National Institute on Drug Abuse; National Institutes of Health; U.S. Department of Health and Human Services.*

References

1. Timberlake DS. A comparison of drug use and dependence between blunt smokers and other cannabis users. *Subst Use Misuse*. 2009;44(3):401-415. doi:10.1080/10826080802347651
2. Mehmedic Z, Chandra S, Slade D, et al. Potency trends of Δ^9 -THC and other cannabinoids in confiscated cannabis preparations from 1993 to 2008. *J Forensic Sci*. 2010;55(5):1209-1217. doi:10.1111/j.1556-4029.2010.01441.x

3. Substance Abuse Center for Behavioral Health Statistics and Quality. Results from the 2018 National Survey on Drug Use and Health: Detailed Tables, SAMHSA.
<https://www.samhsa.gov/data/report/2018-nsduh-detailed-tables>. Accessed December 2019.
4. Carliner H, Mauro PM, Brown QL, et al. The widening gender gap in marijuana use prevalence in the U.S. during a period of economic change, 2002-2014. *Drug Alcohol Depend.* 2016;170:51-58. doi:10.1016/j.drugalcdep.2016.10.042
5. Johnston L, O'Malley P, Miech R, Bachman J, Schulenberg J. *Monitoring the Future National Survey Results on Drug Use: 1975-2018: Overview: Key Findings on Adolescent Drug Use*. Ann Arbor, MI: Institute for Social Research, The University of Michigan; 2018.
6. Center for Behavioral Health Statistics and Quality (CBHSQ). *Drug Abuse Warning Network: 2011: Selected Tables of National Estimates of Drug-Related Emergency Department Visits*. Rockville, MD: Substance Abuse and Mental Health Services Administration; 2013.
7. Lenné MG, Dietze PM, Triggs TJ, Walmsley S, Murphy B, Redman JR. The effects of cannabis and alcohol on simulated arterial driving: Influences of driving experience and task demand. *Accid Anal Prev.* 2010;42(3):859-866. doi:10.1016/j.aap.2009.04.021
8. Hartman RL, Huestis MA. Cannabis effects on driving skills. *Clin Chem.* 2013;59(3):478-492. doi:10.1373/clinchem.2012.194381
9. Hartman RL, Brown TL, Milavetz G, et al. Cannabis effects on driving lateral control with and without alcohol. *Drug Alcohol Depend.* 2015;154:25-37. doi:10.1016/j.drugalcdep.2015.06.015
10. Brady JE, Li G. Trends in Alcohol and Other Drugs Detected in Fatally Injured Drivers in the United States, 1999–2010. *Am J Epidemiol.* January 2014:kwt327. doi:10.1093/aje/kwt327
11. Biecheler M-B, Peytavin J-F, Sam Group, Facy F, Martineau H. SAM survey on “drugs and fatal accidents”: search of substances consumed and comparison between drivers involved under the influence of alcohol or cannabis. *Traffic Inj Prev.* 2008;9(1):11-21. doi:10.1080/15389580701737561
12. *DRUID Final Report: Work Performed, Main Results and Recommendations*. EU DRUID Programme; 2012. <http://www.roadsafetyobservatory.com/Evidence/Details/10940>.
13. Elvik R. Risk of road accident associated with the use of drugs: a systematic review and meta-analysis of evidence from epidemiological studies. *Accid Anal Prev.* 2013;60:254-267. doi:10.1016/j.aap.2012.06.017
14. Ramaekers JG, Berghaus G, van Laar M, Drummer OH. Dose related risk of motor vehicle crashes after cannabis use. *Drug Alcohol Depend.* 2004;73(2):109-119.

15. Li M-C, Brady JE, DiMaggio CJ, Lusardi AR, Tzong KY, Li G. Marijuana Use and Motor Vehicle Crashes. *Epidemiol Rev.* 2012;34(1):65-72. doi:10.1093/epirev/mxr017
16. Asbridge M, Hayden JA, Cartwright JL. Acute cannabis consumption and motor vehicle collision risk: systematic review of observational studies and meta-analysis. *BMJ.* 2012;344:e536. doi:10.1136/bmj.e536
17. Compton RP, Berning A. *Drug and Alcohol Crash Risk.* Washington, DC: National Highway Traffic Safety Administration; 2015. DOT HA 812 117.
18. Hasin DS, Saha TD, Kerridge BT, et al. Prevalence of Marijuana Use Disorders in the United States Between 2001-2002 and 2012-2013. *JAMA Psychiatry.* 2015;72(12):1235-1242. doi:10.1001/jamapsychiatry.2015.1858
19. Winters KC, Lee C-YS. Likelihood of developing an alcohol and cannabis use disorder during youth: Association with recent use and age. *Drug Alcohol Depend.* 2008;92(1-3):239-247. doi:10.1016/j.drugalcdep.2007.08.005
20. Budney AJ, Hughes JR. The cannabis withdrawal syndrome. *Curr Opin Psychiatry.* 2006;19(3):233-238. doi:10.1097/01.yco.0000218592.00689.e5
21. Gorelick DA, Levin KH, Copersino ML, et al. Diagnostic Criteria for Cannabis Withdrawal Syndrome. *Drug Alcohol Depend.* 2012;123(1-3):141-147. doi:10.1016/j.drugalcdep.2011.11.007
22. Rotter A, Bayerlein K, Hansbauer M, et al. CB1 and CB2 receptor expression and promoter methylation in patients with cannabis dependence. *Eur Addict Res.* 2013;19(1):13-20. doi:10.1159/000338642
23. Morgan CJA, Page E, Schaefer C, et al. Cerebrospinal fluid anandamide levels, cannabis use and psychotic-like symptoms. *Br J Psychiatry J Ment Sci.* 2013;202(5):381-382. doi:10.1192/bjp.bp.112.121178
24. Anthony JC, Warner LA, Kessler RC. Comparative epidemiology of dependence on tobacco, alcohol, controlled substances, and inhalants: Basic findings from the National Comorbidity Survey. *Exp Clin Psychopharmacol.* 1994;2(3):244-268. doi:10.1037/1064-1297.2.3.244
25. Lopez-Quintero C, Pérez de los Cobos J, Hasin DS, et al. Probability and predictors of transition from first use to dependence on nicotine, alcohol, cannabis, and cocaine: results of the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC). *Drug Alcohol Depend.* 2011;115(1-2):120-130. doi:10.1016/j.drugalcdep.2010.11.004
26. Anthony JC. The epidemiology of cannabis dependence. In: Roffman RA, Stephens RS, eds. *Cannabis Dependence: Its Nature, Consequences and Treatment.* Cambridge, UK: Cambridge

University Press; 2006:58-105.

27. Hall WD, Pacula RL. *Cannabis Use and Dependence: Public Health and Public Policy*. Cambridge, UK: Cambridge University Press; 2003.
28. Center for Behavioral Health Statistics and Quality (CBHSQ). *Treatment Episode Data Set (TEDS): 2003-2013. National Admissions to Substance Abuse Treatment Services*. Rockville, MD: Substance Abuse and Mental Health Services Administration; 2015. BHSIS Series S-75, HHS Publication No. (SMA) 15-4934.
29. Office of National Drug Control Policy, *National Drug Control Strategy Data Supplement 2020, Feb. 2020, p. 95, Table #77* <https://www.whitehouse.gov/wp-content/uploads/2020/02/2020-NDCS-Data-Supplement.pdf>
30. Freeman TP, Morgan CJA, Hindocha C, Schafer G, Das RK, Curran HV. Just say “know”: how do cannabinoid concentrations influence users’ estimates of cannabis potency and the amount they roll in joints? *Addict Abingdon Engl*. 2014;109(10):1686-1694. doi:10.1111/add.12634
31. Van der Pol P, Liebrechts N, Brunt T, et al. Cross-sectional and prospective relation of cannabis potency, dosing and smoking behaviour with cannabis dependence: an ecological study. *Addict Abingdon Engl*. 2014;109(7):1101-1109. doi:10.1111/add.12508
32. Campolongo P, Trezza V, Cassano T, et al. Perinatal exposure to delta-9-tetrahydrocannabinol causes enduring cognitive deficits associated with alteration of cortical gene expression and neurotransmission in rats. *Addict Biol*. 2007;12(3-4):485-495. doi:10.1111/j.1369-1600.2007.00074.x
33. Antonelli T, Tomasini MC, Tattoli M, et al. Prenatal exposure to the CB1 receptor agonist WIN 55,212-2 causes learning disruption associated with impaired cortical NMDA receptor function and emotional reactivity changes in rat offspring. *Cereb Cortex N Y N 1991*. 2005;15(12):2013-2020. doi:10.1093/cercor/bhi076
34. Verrico CD, Gu H, Peterson ML, Sampson AR, Lewis DA. Repeated Δ^9 -tetrahydrocannabinol exposure in adolescent monkeys: persistent effects selective for spatial working memory. *Am J Psychiatry*. 2014;171(4):416-425. doi:10.1176/appi.ajp.2013.13030335
35. Rubino T, Realini N, Braida D, et al. Changes in hippocampal morphology and neuroplasticity induced by adolescent THC treatment are associated with cognitive impairment in adulthood. *Hippocampus*. 2009;19(8):763-772. doi:10.1002/hipo.20554
36. Gleason KA, Birnbaum SG, Shukla A, Ghose S. Susceptibility of the adolescent brain to cannabinoids: long-term hippocampal effects and relevance to schizophrenia. *Transl Psychiatry*. 2012;2:e199. doi:10.1038/tp.2012.122

37. Quinn HR, Matsumoto I, Callaghan PD, et al. Adolescent rats find repeated Delta(9)-THC less aversive than adult rats but display greater residual cognitive deficits and changes in hippocampal protein expression following exposure. *Neuropsychopharmacol Off Publ Am Coll Neuropsychopharmacol*. 2008;33(5):1113-1126. doi:10.1038/sj.npp.1301475
38. Batalla A, Bhattacharyya S, Yücel M, et al. Structural and functional imaging studies in chronic cannabis users: a systematic review of adolescent and adult findings. *PLoS One*. 2013;8(2):e55821. doi:10.1371/journal.pone.0055821
39. Filbey FM, Aslan S, Calhoun VD, et al. Long-term effects of marijuana use on the brain. *Proc Natl Acad Sci U S A*. 2014;111(47):16913-16918. doi:10.1073/pnas.1415297111
40. Pagliaccio D, Barch DM, Bogdan R, et al. Shared predisposition in the association between cannabis use and subcortical brain structure. *JAMA Psychiatry*. 2015;72(10):994-1001. doi:10.1001/jamapsychiatry.2015.1054
41. Volkow ND, Swanson JM, Evins AE, et al. Effects of cannabis use on human behavior, including cognition, motivation, and psychosis: a review. *JAMA Psychiatry*. 2016;73(3):292-297. doi:10.1001/jamapsychiatry.2015.3278
42. Auer R, Vittinghoff E, Yaffe K, et al. Association between lifetime marijuana use and cognitive function in middle age: the Coronary Artery Risk Development in Young Adults (CARDIA) Study. *JAMA Intern Med*. February 2016. doi:10.1001/jamainternmed.2015.7841
43. Meier MH, Caspi A, Ambler A, et al. Persistent cannabis users show neuropsychological decline from childhood to midlife. *Proc Natl Acad Sci U S A*. 2012;109(40):E2657-E2664. doi:10.1073/pnas.1206820109
44. Jackson NJ, Isen JD, Khoddam R, et al. Impact of adolescent marijuana use on intelligence: Results from two longitudinal twin studies. *Proc Natl Acad Sci U S A*. 2016;113(5):E500-E508. doi:10.1073/pnas.1516648113
45. Secades-Villa R, Garcia-Rodríguez O, Jin CJ, Wang S, Blanco C. Probability and predictors of the cannabis gateway effect: a national study. *Int J Drug Policy*. 2015;26(2):135-142. doi:10.1016/j.drugpo.2014.07.011
46. Weinberger AH, Platt J, Goodwin RD. Is cannabis use associated with an increased risk of onset and persistence of alcohol use disorders? A three-year prospective study among adults in the United States. *Drug Alcohol Depend*. February 2016. doi:10.1016/j.drugalcdep.2016.01.014
47. Pistis M, Perra S, Pillolla G, Melis M, Muntoni AL, Gessa GL. Adolescent exposure to cannabinoids induces long-lasting changes in the response to drugs of abuse of rat midbrain dopamine neurons. *Biol Psychiatry*. 2004;56(2):86-94. doi:10.1016/j.biopsych.2004.05.006

48. Agrawal A, Neale MC, Prescott CA, Kendler KS. A twin study of early cannabis use and subsequent use and abuse/dependence of other illicit drugs. *Psychol Med*. 2004;34(7):1227-1237.
49. Panlilio LV, Zanettini C, Barnes C, Solinas M, Goldberg SR. Prior exposure to THC increases the addictive effects of nicotine in rats. *Neuropsychopharmacol Off Publ Am Coll Neuropsychopharmacol*. 2013;38(7):1198-1208. doi:10.1038/npp.2013.16
50. Cadoni C, Pisanu A, Solinas M, Acquas E, Di Chiara G. Behavioural sensitization after repeated exposure to Delta 9-tetrahydrocannabinol and cross-sensitization with morphine. *Psychopharmacology (Berl)*. 2001;158(3):259-266. doi:10.1007/s002130100875
51. Levine A, Huang Y, Drisaldi B, et al. Molecular mechanism for a gateway drug: epigenetic changes initiated by nicotine prime gene expression by cocaine. *Sci Transl Med*. 2011;3(107):107ra109. doi:10.1126/scitranslmed.3003062
52. Schweinsburg AD, Brown SA, Tapert SF. The influence of marijuana use on neurocognitive functioning in adolescents. *Curr Drug Abuse Rev*. 2008;1(1):99-111.
53. Macleod J, Oakes R, Copello A, 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 Lond Engl*. 2004;363(9421):1579-1588. doi:10.1016/S0140-6736(04)16200-4
54. Silins E, Horwood LJ, Patton GC, et al. Young adult sequelae of adolescent cannabis use: an integrative analysis. *Lancet Psychiatry*. 2014;1(4):286-293. doi:10.1016/S2215-0366(14)70307-4
55. Fergusson DM, Boden JM. Cannabis use and later life outcomes. *Addict Abingdon Engl*. 2008;103(6):969-976; discussion 977-978. doi:10.1111/j.1360-0443.2008.02221.x
56. Brook JS, Lee JY, Finch SJ, Seltzer N, Brook DW. Adult work commitment, financial stability, and social environment as related to trajectories of marijuana use beginning in adolescence. *Subst Abuse*. 2013;34(3):298-305. doi:10.1080/08897077.2013.775092
57. McCaffrey DF, Pacula RL, Han B, Ellickson P. Marijuana Use and High School Dropout: The Influence of Unobservables. *Health Econ*. 2010;19(11):1281-1299. doi:10.1002/hec.1561
58. Gruber AJ, Pope HG, Hudson JI, Yurgelun-Todd D. Attributes of long-term heavy cannabis users: a case-control study. *Psychol Med*. 2003;33(8):1415-1422.
59. Macdonald S, Hall W, Roman P, Stockwell T, Coghlan M, Nesvaag S. Testing for cannabis in the work-place: a review of the evidence. *Addict Abingdon Engl*. 2010;105(3):408-416. doi:10.1111/j.1360-0443.2009.02808.x
60. Zwerling C, Ryan J, Orav EJ. The efficacy of preemployment drug screening for marijuana and cocaine in predicting employment outcome. *JAMA*. 1990;264(20):2639-2643.

61. Radhakrishnan R, Wilkinson ST, D'Souza DC. Gone to Pot - A Review of the Association between Cannabis and Psychosis. *Front Psychiatry*. 2014;5:54. doi:10.3389/fpsy.2014.00054
62. Blanco C, Hasin DS, Wall MM, et al. Cannabis Use and Risk of Psychiatric Disorders: Prospective Evidence From a US National Longitudinal Study. *JAMA Psychiatry*. February 2016. doi:10.1001/jamapsychiatry.2015.3229
63. Di Forti M, Iyegbe C, Sallis H, et al. Confirmation that the AKT1 (rs2494732) genotype influences the risk of psychosis in cannabis users. *Biol Psychiatry*. 2012;72(10):811-816. doi:10.1016/j.biopsych.2012.06.020
64. Caspi A, Moffitt TE, Cannon M, et al. Moderation of the effect of adolescent-onset cannabis use on adult psychosis by a functional polymorphism in the catechol-O-methyltransferase gene: longitudinal evidence of a gene X environment interaction. *Biol Psychiatry*. 2005;57(10):1117-1127. doi:10.1016/j.biopsych.2005.01.026
65. Delforterie MJ, Lynskey MT, Huizink AC, et al. The relationship between cannabis involvement and suicidal thoughts and behaviors. *Drug Alcohol Depend*. 2015;150:98-104. doi:10.1016/j.drugalcdep.2015.02.019
66. Borges G, Bagge CL, Orozco R. A literature review and meta-analyses of cannabis use and suicidality. *J Affect Disord*. 2016;195:63-74. doi:10.1016/j.jad.2016.02.007
67. Tashkin DP. Effects of marijuana smoking on the lung. *Ann Am Thorac Soc*. 2013;10(3):239-247. doi:10.1513/AnnalsATS.201212-127FR
68. Owen KP, Sutter ME, Albertson TE. Marijuana: respiratory tract effects. *Clin Rev Allergy Immunol*. 2014;46(1):65-81. doi:10.1007/s12016-013-8374-y
69. Polen MR, Sidney S, Tekawa IS, Sadler M, Friedman GD. Health care use by frequent marijuana smokers who do not smoke tobacco. *West J Med*. 1993;158(6):596-601.
70. Hashibe M, Morgenstern H, Cui Y, et al. Marijuana use and the risk of lung and upper aerodigestive tract cancers: results of a population-based case-control study. *Cancer Epidemiol Biomark Prev Publ Am Assoc Cancer Res Cosponsored Am Soc Prev Oncol*. 2006;15(10):1829-1834. doi:10.1158/1055-9965.EPI-06-0330
71. Hancox RJ, Poulton R, Ely M, et al. Effects of cannabis on lung function: a population-based cohort study. *Eur Respir J*. 2010;35(1):42-47. doi:10.1183/09031936.00065009
72. Mittleman MA, Lewis RA, Maclure M, Sherwood JB, Muller JE. Triggering Myocardial Infarction by Marijuana. *Circulation*. 2001;103(23):2805-2809. doi:10.1161/01.CIR.103.23.2805

73. Thomas G, Kloner RA, Rezkalla S. Adverse cardiovascular, cerebrovascular, and peripheral vascular effects of marijuana inhalation: what cardiologists need to know. *Am J Cardiol*. 2014;113(1):187-190. doi:10.1016/j.amjcard.2013.09.042
74. Jones RT. Cardiovascular system effects of marijuana. *J Clin Pharmacol*. 2002;42(11 Suppl):58S - 63S.
75. Lacson JCA, Carroll JD, Tuazon E, Castelao EJ, Bernstein L, Cortessis VK. Population-based case-control study of recreational drug use and testis cancer risk confirms an association between marijuana use and nonseminoma risk. *Cancer*. 2012;118(21):5374-5383. doi:10.1002/cncr.27554
76. Daling JR, Doody DR, Sun X, et al. Association of marijuana use and the incidence of testicular germ cell tumors. *Cancer*. 2009;115(6):1215-1223. doi:10.1002/cncr.24159
77. Galli JA, Sawaya RA, FriedenberG FK. Cannabinoid Hyperemesis Syndrome. *Curr Drug Abuse Rev* . 2011;4(4):241-249.
78. Bachhuber MA, Saloner B, Cunningham CO, Barry CL. Medical cannabis laws and opioid analgesic overdose mortality in the United States, 1999-2010. *JAMA Intern Med*. 2014;174(10):1668-1673. doi:10.1001/jamainternmed.2014.4005
79. Chelsea L. Shover, Corey S. Davis, Sanford C. Gordon, and Keith Humphreys, Association between medical cannabis laws and opioid overdose mortality has reversed over time, *PNAS* June 25, 2019 116 (26) 12624-12626.
80. Röhrich J, Schimmel I, Zörntlein S, et al. Concentrations of delta9-tetrahydrocannabinol and 11-nor-9-carboxytetrahydrocannabinol in blood and urine after passive exposure to Cannabis smoke in a coffee shop. *J Anal Toxicol*. 2010;34(4):196-203.
81. Cone EJ, Bigelow GE, Herrmann ES, et al. Non-smoker exposure to secondhand cannabis smoke. I. Urine screening and confirmation results. *J Anal Toxicol*. 2015;39(1):1-12. doi:10.1093/jat/bku116
82. Wang X, Derakhshandeh R, Liu J, et al. One Minute of Marijuana Secondhand Smoke Exposure Substantially Impairs Vascular Endothelial Function. *J Am Heart Assoc*. 2016;5(8). doi:10.1161/JAHA.116.003858
83. Martin CE, Longinaker N, Mark K, Chisolm MS, Terplan M. Recent trends in treatment admissions for marijuana use during pregnancy. *J Addict Med*. 2015;9(2):99-104. doi:10.1097/ADM.0000000000000095
84. Young-Wolff KC, Tucker L-Y, Alexeeff S, et al. Trends in Self-reported and Biochemically Tested Marijuana Use Among Pregnant Females in California From 2009-2016. *JAMA*. 2017;318(24):2490. doi:10.1001/jama.2017.17225

85. Kline J, Hutzler M, Levin B, Stein Z, Susser M, Warburton D. Marijuana and spontaneous abortion of known karyotype. *Paediatr Perinat Epidemiol*. 1991;5(3):320-332.
86. Wilcox AJ, Weinberg CR, Baird DD. Risk factors for early pregnancy loss. *Epidemiol Camb Mass*. 1990;1(5):382-385.
87. Asch RH, Smith CG. Effects of delta 9-THC, the principal psychoactive component of marijuana, during pregnancy in the rhesus monkey. *J Reprod Med*. 1986;31(12):1071-1081.
88. Campolongo P, Trezza V, Ratano P, Palmery M, Cuomo V. Developmental consequences of perinatal cannabis exposure: behavioral and neuroendocrine effects in adult rodents. *Psychopharmacology (Berl)*. 2011;214(1):5-15. doi:10.1007/s00213-010-1892-x
89. Fried PA, Watkinson B, Gray R. A follow-up study of attentional behavior in 6-year-old children exposed prenatally to marijuana, cigarettes, and alcohol. *Neurotoxicol Teratol*. 1992;14(5):299-311.
90. Goldschmidt L, Day NL, Richardson GA. Effects of prenatal marijuana exposure on child behavior problems at age 10. *Neurotoxicol Teratol*. 2000;22(3):325-336.
91. Fried PA, Smith AM. A literature review of the consequences of prenatal marijuana exposure. An emerging theme of a deficiency in aspects of executive function. *Neurotoxicol Teratol*. 2001;23(1):1-11.
92. Janisse JJ, Bailey BA, Ager J, Sokol RJ. Alcohol, tobacco, cocaine, and marijuana use: relative contributions to preterm delivery and fetal growth restriction. *Subst Abuse*. 2014;35(1):60-67. doi:10.1080/08897077.2013.804483
93. Hayatbakhsh MR, Flenady VJ, Gibbons KS, et al. Birth outcomes associated with cannabis use before and during pregnancy. *Pediatr Res*. 2012;71(2):215-219. doi:10.1038/pr.2011.25
94. Shiono PH, Klebanoff MA, Nugent RP, et al. The impact of cocaine and marijuana use on low birth weight and preterm birth: a multicenter study. *Am J Obstet Gynecol*. 1995;172(1 Pt 1):19-27.
95. Mark K, Desai A, Terplan M. Marijuana use and pregnancy: prevalence, associated characteristics, and birth outcomes. *Arch Womens Ment Health*. 2016;19(1):105-111. doi:10.1007/s00737-015-0529-9
96. Schempf AH, Strobino DM. Illicit Drug Use and Adverse Birth Outcomes: Is It Drugs or Context? *J Urban Health Bull N Y Acad Med*. 2008;85(6):858-873. doi:10.1007/s11524-008-9315-6
97. Tobacco, drug use in pregnancy can double risk of stillbirth. <https://www.nichd.nih.gov/news/releases/Pages/121113-stillbirth-drug-use.aspx>. Accessed December 16, 2016.

98. Marijuana Use During Pregnancy and Lactation - ACOG. ACOG. <http://www.acog.org/Resources-And-Publications/Committee-Opinions/Committee-on-Obstetric-Practice/Marijuana-Use-During-Pregnancy-and-Lactation>. Published July 2015. Accessed October 12, 2016.
99. Roberson EK, Patrick WK, Hurwitz EL. Marijuana use and maternal experiences of severe nausea during pregnancy in Hawai'i. *Hawaii J Med Public Health J Asia Pac Med Public Health*. 2014;73(9):283-287.
100. Westfall RE, Janssen PA, Lucas P, Capler R. Survey of medicinal cannabis use among childbearing women: patterns of its use in pregnancy and retroactive self-assessment of its efficacy against "morning sickness." *Complement Ther Clin Pract*. 2006;12(1):27-33. doi:10.1016/j.ctcp.2005.09.006
101. Trezza V, Campolongo P, Cassano T, et al. Effects of perinatal exposure to delta-9-tetrahydrocannabinol on the emotional reactivity of the offspring: a longitudinal behavioral study in Wistar rats. *Psychopharmacology (Berl)*. 2008;198(4):529-537. doi:10.1007/s00213-008-1162-3
102. Mereu G, Fà M, Ferraro L, et al. Prenatal exposure to a cannabinoid agonist produces memory deficits linked to dysfunction in hippocampal long-term potentiation and glutamate release. *Proc Natl Acad Sci U S A*. 2003;100(8):4915-4920. doi:10.1073/pnas.0537849100
103. Fried PA, Makin JE. Neonatal behavioural correlates of prenatal exposure to marijuana, cigarettes and alcohol in a low risk population. *Neurotoxicol Teratol*. 1987;9(1):1-7.
104. De Moraes Barros MC, Guinsburg R, Mitsuhiro S, Chalem E, Laranjeira RR. Neurobehavioral profile of healthy full-term newborn infants of adolescent mothers. *Early Hum Dev*. 2008;84(5):281-287. doi:10.1016/j.earlhumdev.2007.07.001
105. Richardson GA, Ryan C, Willford J, Day NL, Goldschmidt L. Prenatal alcohol and marijuana exposure: effects on neuropsychological outcomes at 10 years. *Neurotoxicol Teratol*. 2002;24(3):309-320.
106. Goldschmidt L, Day NL, Richardson GA. Effects of prenatal marijuana exposure on child behavior problems at age 10. *Neurotoxicol Teratol*. 2000;22(3):325-336.
107. Sonon KE, Richardson GA, Cornelius JR, Kim KH, Day NL. Prenatal marijuana exposure predicts marijuana use in young adulthood. *Neurotoxicol Teratol*. 2015;47:10-15. doi:10.1016/j.ntt.2014.11.003
108. Perez-Reyes M, Wall ME. Presence of delta9-tetrahydrocannabinol in human milk. *N Engl J Med*. 1982;307(13):819-820. doi:10.1056/NEJM198209233071311

109. Astley SJ, Little RE. Maternal marijuana use during lactation and infant development at one year. *Neurotoxicol Teratol.* 1990;12(2):161-168.
110. Djulus J, Moretti M, Koren G. Marijuana use and breastfeeding. *Can Fam Physician Médecin Fam Can.* 2005;51:349-350.
111. Budney AJ, Roffman R, Stephens RS, Walker D. Marijuana Dependence and Its Treatment. *Addict Sci Clin Pract.* 2007;4(1):4-16.
112. Diamond G, Panichelli-Mindel SM, Shera D, Dennis M, Tims F, Ungemack J. Psychiatric Syndromes in Adolescents with Marijuana Abuse and Dependency in Outpatient Treatment. *J Child Adolesc Subst Abuse.* 2006;15(4):37-54. doi:10.1300/J029v15n04_02
113. Di Forti M, Quattrone D, Freeman TP, et al. The contribution of cannabis use to variation in the incidence of psychotic disorder across Europe (EU-GEI): a multicentre case-control study. *The Lancet* 2019;6(5):427-436 doi. 10.1016/S2215-0366(19)30048-3

Medical cannabis patterns of use and substitution for opioids & other pharmaceutical drugs, alcohol, tobacco, and illicit substances; results from a cross-sectional survey of authorized patients

- [Philippe Lucas](#),
- [Eric P. Baron](#) &
- [Nick Jikomes](#)

[Harm Reduction Journal](#) volume 16, Article number: 9 (2019) [Cite this article](#)

- 8475 Accesses
- 4 Citations
- 240 Altmetric
- [Metricsdetails](#)

Abstract

Background

A 239-question cross-sectional survey was sent out via email in January 2017 to gather comprehensive information on cannabis use from Canadian medical cannabis patients registered with a federally authorized licensed cannabis producer, resulting in 2032 complete surveys.

Methods

The survey gathered detailed demographic data and comprehensive information on patient patterns of medical cannabis use, including questions assessing the self-reported impact of cannabis on the use of prescription drugs, illicit substances, alcohol, and tobacco.

Results

Participants were 62.6% male ($n = 1271$) and 91% Caucasian ($n = 1839$). The mean age was 40 years old, and pain and mental health conditions accounted for 83.7% of all respondents ($n = 1700$). Then, 74.6% of respondents reported daily cannabis use

($n = 1515$) and mean amount used per day was 1.5 g. The most commonly cited substitution was for prescription drugs (69.1%, $n = 953$), followed by alcohol (44.5%, $n = 515$), tobacco (31.1%, $n = 406$), and illicit substances (26.6%, $n = 136$). Opioid medications accounted for 35.3% of all prescription drug substitution ($n = 610$), followed by antidepressants (21.5%, $n = 371$). Of the 610 mentions of specific opioid medications, patients report total cessation of use of 59.3% ($n = 362$).

Conclusions

This study offers a unique perspective by focusing on the use of a standardized, government-**regulated source of medical cannabis by patients registered in Canada's** federal medical cannabis program. The findings provide a granular view of patient patterns of medical cannabis use, and the subsequent self-reported impacts on the use of opioids, alcohol, and other substances, adding to a growing body of academic research suggesting that increased regulated access to medical and recreational cannabis can result in a reduction in the use of and subsequent harms associated with opioids, alcohol, tobacco, and other substances.

Background

Cannabis is the most widely used illicit substance in the world [1, 2]. Its use has been associated with both personal and social benefits as well as harms [2, 3]. While research supports the therapeutic use of cannabis in the treatment of chronic pain and other conditions [4,5,6,7,8], a comprehensive examination of the public health and safety impacts of cannabis needs to consider the growing body of evidence suggesting its use affects the use of potentially more problematic legal substances like alcohol and tobacco, and illicit substances like cocaine, heroin, and other opioids.

Bachhuber et al. (2014) report that US states with medical cannabis laws had a 24.8% lower mean annual opioid overdose mortality rate compared to states without medical **cannabis laws (95% CI – 37.5% to – 9.5%, $p = .003$)**, and this trend strengthened over time. An examination of opioid positivity in fatally injured drivers in the USA found that state-based medical cannabis programs were associated with lower rates among 21 to 40 year olds, with the authors concluding that regulated access to medical cannabis may reduce opioid use and associated overdoses [9]. More recently, a cross-sectional study of state implementation of medical and adult-use cannabis laws from 2011 to 2016 found that medical cannabis laws were associated with a 5.88% lower rate of opioid prescribing [10].

Additional population-level research has explored how the recent introduction of regimes for legal access to cannabis (e.g., medical and/or recreational) in some US states has preceded reductions in homicides and violent crime [11], suicides [12], and automobile-related fatalities [13, 14], with all theorizing that these public health and safety benefits are related to subsequent declines in alcohol use.

However, cannabis use is not without potential harms. Chronic use has been associated with potential neurocognitive impairments particularly in adolescent use, and the psychoactive effects of use and associated impairment can lead to increased personal health and public safety risks associated with driving [15, 16]. While evidence suggests that smoking as a route of administration may increase the risk of bronchial issues [17, 18], the evidence in regards to associations between cannabis smoking and cancer is inconclusive. While some research has found a moderate increased risk of lung cancer in heavy users [19, 20], other studies have concluded that no causal association exists [17, 18, 21, 22]. It is important to note that the literature describing adverse events of cannabis including cardiovascular or cerebrovascular events is based on cannabis use from the black market without standardized quality control. Thus, these reports are based on cannabis of unknown quality, toxins, heavy metals, fungal/bacterial elements, strains, cannabinoid and terpene profiles, illicit drug use (laced cannabis or simultaneous use), concurrent prescription drug use, underlying patient medical history such as vascular risk factors, and many other cofounders which can influence adverse events.

There may also be some vulnerable populations in which risks are increased, such as women who may be pregnant, although the limited literature examining impacts of cannabis use on pregnancy is clouded by contradictory findings [23, 24]. Youth may be at greater risk since cannabis may have more significant cognitive and psychological impacts on developing brains [25, 26], and those with a pre-disposition for psychosis or schizophrenia may be particularly vulnerable since cannabis may perpetuate and potentially aggravate these conditions [27,28,29].

Social harms associated with cannabis include the impacts of impairment on driving [30, 31], and financial impacts on health care and police, court and incarceration costs resulting from prohibition [16, 32,33,34]. Some of the health-related harms and associated costs may be increased by the current international prohibition on cannabis, which leaves control over cannabis production and distribution to the black market. This criminal justice approach to cannabis regulation results in the criminalization of end-users, and consumers purchasing cannabis products of unknown potency, with no quality controls or age restrictions on access [2, 35, 36], making it challenging to study the actual impacts of cannabis use on individuals without significant confounders related to both prohibition and the black-market control over production and distribution.

Recently, these negative policy-related outcomes have led many jurisdictions to try alternative regulatory approaches, including the legalization of medical cannabis use in Canada and much of Latin American and the European Union, and the regulation of recreational adult use in a number of US states, Canada, and Uruguay. This study provides a unique perspective by focusing on the use of a standardized, government-**regulated source of medical cannabis by patients registered in Canada's federal medical** cannabis program. The findings provide a more granular view of patient patterns of medical cannabis use, and the subsequent self-reported impacts on the use of opioids, alcohol and other substances.

Medical cannabis in Canada

In response to legal recognition of the constitutional rights of Canadians to access cannabis for medical purposes, in 2001, Canada became one of the first nations in the world to establish a national medical cannabis program [37, 38]. The Marihuana Medical Access Regulations (MMAR) allowed patients with chronic or incurable medical conditions like cancer, MS, HIV/AIDS, and severe chronic pain to apply to Health Canada for permission to possess a limited amount of medical cannabis, and in 2003 Health Canada began to provide patients with access to a legal source of flower cannabis consisting of a single cultivar produced under a federal contract and shipped to patients via mail [37].

The program has undergone numerous changes since its initiation due to shifts in policy and in response to successful legal challenges by patients who found the program inadequate in addressing their medical needs [39, 40]. This culminated in the establishment of the Marihuana for Medical Purposes Regulations (MMPR) in 2014, and ultimately in the Access to Cannabis for Medical Purposes Regulations (ACMPR) in August 2016 [37]. One of the primary changes of the MMPR/ACMPR was the authorization of multiple licensed producers (LPs) of cannabis. Under the ACMPR, patients get cannabis recommendations from physicians or nurse practitioners without the past restrictions on medical conditions found in the MMAR, and can then grow a limited amount of their own cannabis and/or access it from LPs, who ship it directly to patients via mail [38, 41]. As of September 2018, there were over 130 federally authorized licensed producers providing hundreds of strains of cannabis as well as cannabis extracts like oils or capsules to approximately 342,103 patients [42]. Under the ACMPR, health care providers (HCPs) make a written recommendation of the amount **of cannabis that patients are authorized to use and ultimately possess in “grams per day”**; it is the responsibility of each LP to determine the quantity of cannabis oil that is equivalent to 1 g of dried cannabis [42]. While some HCPs provide restrictions in regards to the potency or type of cannabis patients may order from LPs and subsequently use, no condition-specific clinical guidelines have been developed yet, and patients are typically free to order and use whatever type of cannabis (i.e., specific cultivars, potencies, or types of cannabis products) they feel may work best in addressing their medical conditions or symptoms [37, 41, 43].

As part of the ACMPR, Health Canada keeps detailed records of the amount of cannabis produced and distributed to patients; however, there is very little data on what conditions or symptoms affect these patients, how they use cannabis products (i.e., type of product/mode of use, frequency and dosages), and the impact of that use on the use of prescription medications, alcohol, tobacco, and other substances.

Methods

In the interest of learning more about why/how patients use medical cannabis and whether this use affects the use of other substances, a 239-question patient feedback questionnaire was designed to gather comprehensive information on patient demographics, patterns of cannabis use, access to cannabis, and cannabis substitution

effect from 2000 Canadian medical cannabis patients registered with Tilray, a federally authorized medical cannabis production, distribution, and research company located in Nanaimo, BC. This presented a unique cohort of cannabis users to assess, since they accessed a quality-tested, standardized cannabis supply under the auspice of a legal, tightly regulated medical cannabis regime.

The primary objectives of the Tilray Patient Survey 2017 were to:

1. 1.

Describe the characteristics of the sample, including patient demographics, use of cannabis, prescription drugs, alcohol, tobacco, and illicit substances.

2. 2.

Assess the extent to which cannabis is used as a substitute for prescription drugs, alcohol, tobacco, and illicit substances, and differences in the extent of substitution among the most frequently used drugs.

3. 3.

Assess the extent to which substitution is mediated by age, gender, primary medical condition/symptoms, cannabis strains, and method of use.

This survey was ethics reviewed and approved by Advarra (formerly Institutional Review Board Services), and the University of Victoria subsequently approved a post-survey sub-analysis of the substitution data. Data gathering was done on REDCap, a HIPAA, and PIPEDA compliant electronic data capture system. HIPAA (Health Insurance Portability and Accountability Act of 1996) is US legislation that provides data privacy and security provisions for safeguarding medical information, and PIPEDA is the Canadian federal privacy law governing private-sector organizations.

Participants were adult federally authorized medical cannabis patients registered with Tilray that provided the company with an email address, were capable of reading and understanding French or English, and were able to legally consent to participate in the study.

A password-protected link to an online survey available in French and English was sent out to 16,675 Tilray patients. Clicking on the link in the email invitation took patients to the IRB-approved informed consent form (ICF), and consent was gathered **electronically. All questions were set to “must provide value”, so all questionnaires were fully answered with the exclusion of questions not relevant to individual respondents (i.e., if patients never used tobacco, then questions re. tobacco substitution were programmed not to appear via REDCap’s “skip logic” function). To compensate patients for taking the time to respond and share their experiences, Tilray offered a \$10 credit on**

future cannabis purchases to all patients who completed the survey. The study budget of \$20,000 allowed for the gathering of up to 2000 responses, and the survey deliberately closed after gathering 2032 complete responses (32 participants were in the process of completing the survey when this cut off was met so they were permitted to finish, resulting in 2032 complete surveys).

Measures

The survey was composed of multiple choice, ranking, and open-ended questions to gather demographic data, health-related information, and details on medical cannabis use and its impact on the use of other substances. A question regarding primary condition provided a selection of 21 common medical conditions for which patients chose to use cannabis, and participants could only click one box (or click *other* and provide details in a text box), but a follow-up question regarding primary symptoms allowed participants to click multiple boxes from a selection of 13 common symptoms (or to click *other* and provide details in a text box). This allowed for a broader analysis of why patients specifically use medical cannabis in the treatment of different conditions; for example a participant citing *MS* as a primary condition might report use of cannabis to address *insomnia*, *pain*, and *spasticity* under primary symptoms.

A comprehensive assessment of cannabis use included questions on frequency of use per day and per week; yesterday use; amount used per session of use, as well as per day and per week; methods of ingestion (*Vaporizer—cannabis flowers/bud*; *Oral (edibles such as oil drops/extracts, baked goods, butter, tincture)*, *Joint*; *Pipe*; *Waterpipe/bong*; *Vaporizer/nail/vape pen—cannabis extracts (shatter, budder, oil, etc.)*; *Topical (on the skin; e.g., lotions/salves, etc.)*; *Juicing* (4, 0.2%); *Other (please specify)*); preferred cannabis flower variety as classified by Tilray (either *indica*, *sativa*, *hybrid*, *1:1 CBD/THC*, *3:1 CBD/THC*); and favorite cultivar/strain with a drop-down menu of all 37 cultivars or blended milled **flower available from Tilray to that point, and an “other” option with an additional** textual response. Those who acknowledged use of Tilray extract products (oil-based *drops* or *capsules*) were asked about their preferred type of extract as labeled by the producer (*indica*, *sativa*, *hybrid*, *1:1 CBD/THC*, *3:1 CBD/THC*), frequency of use per day, and whether or not they also used flower, and if so, what percentage of their use was flower vs. extract in a quintile range from 10% flower/90% extract to 10% extract/90% flower. Participants were also asked to rank their current level of cannabis knowledge from 0 to 100, with 1 being *no knowledge and experience at all*, and 100 being *very knowledgeable and experienced*.

In order to assess substitution, participants were asked if they “ever regularly used or currently use” any of the following four classes of drugs: *prescription drugs*, *alcohol*, *tobacco*, and *illicit substances*. Those who responded positively were then asked if they had ever used cannabis as a substitute for these substances. Those that responded positively to substitution for either prescription drugs or illicit drugs were then asked to name up to three specific drugs they substituted for, and then asked at what percent they substituted cannabis for each specific drug by choosing from the following options in a multiple choice, single-answer: 100% (Stopped using this drug

completely); 75% (Reduced my use of this drug by 3/4); 50% (Reduced my use of this drug by half); 25% (Reduced my use of this drug by 1/4).

For both alcohol and tobacco, participants who responded positively to substitution were then asked at what quartile percent they substituted via the same multiple choice used to assess the self-reported rate of substitution for prescription and illicit substances highlighted above.

Analysis

Primary analysis for this study was done on SPSS. Objective 1 was assessed using descriptive statistics (frequencies) to describe the characteristics of the sample. The distribution of the qualitative responses for *other* in both the primary condition and primary symptoms questions were examined and recoded if they match with the listed conditions; otherwise, they were left as *other*. Amount of flower cannabis was determined by examining self-reported cannabis use per week in grams, and extract use **by frequency of daily and weekly use (“times per day” × “days per week” use).**

Objective 2 was assessed using descriptive statistics to quantify the degree of substitution based on quartiles from 25 to 100%. Several independent frequencies were conducted for the percent of substitution from 0 (recoded to 0, if no other percent is given) to 100, restricted only to those who reported any regular lifetime use for each substance. Analyses recoded the prescription drugs into logical sub-categories (i.e., opioids, benzos, antidepressants, muscle relaxants, etc.), as well as the illicit substances (i.e., cocaine/crack cocaine, opioids, stimulants, psychedelics, etc.).

Objective 3 was assessed using bivariate logistic regression analyses for substitution effect of each major drug (i.e., opioids, alcohol, tobacco, and illicit substances), which were recorded as dichotomous variables (DVs). Medical condition/symptoms (i.e., pain, mental health) were reduced into a smaller number of logical groupings—*arthritis/musculoskeletal* and *headache* were grouped with *chronic pain* to form a broader chronic pain category, and *PTSD* was grouped with *mental health* to create a broader mental health primary condition category, and *stress, anxiety, depression* were grouped to create a broader primary symptoms category—and treated as categorical IVs. Similarly, cannabis flower varieties and extracts were grouped to best reflect THC/CBD ratios ranging from “high THC/low CBD” to “High CBD/low THC”.

Results

The mean age of the sample was 40 years old, 1271 of which identified as *male* (62.6%), 758 *female* (37.3%), and 3 as *Other* (non-binary, transmasculine) (0.15%). In terms of marital status and racial backgrounds, 54.5% were *married or in domestic partnership* ($n = 1107$), and 91% ($n = 1839$) identified as *Caucasian*; 6% [122] *Metis/First Nations*, 2% [37] *South Asian*, and 2% [35] *Asian*. This was a highly educated population compared to the Canadian General Population (CGP); 93% ($n = 1893$) of participants had a *high school degree* (compared to 87% CGP) and 22%

($n = 444$) had a *university degree or higher* (compared to 17% of CGP) [44]. In regards to employment status, 63% of participants worked *full time* or *part time* ($n = 1276$), and 19% were *disabled/not able* to work ($n = 384$). In terms of income, participants were nearly identical to the CGP: 6.6% made less than \$10,000 ($n = 135$; CGP = 5%), 25.6% made \$10,000–\$39,999 ($n = 521$; CGP: 27%), 42% made \$40,000–\$99,999 ($n = 852$; CGP: 42%), and 26% made \$ > 100,000 ($n = 524$; CGP: 26%) [44].

Primary condition and symptoms

In terms of primary condition and primary symptoms, pain and mental health conditions were dominant, as seen in Table 1 and Table 2, respectively. For primary condition, *chronic pain* was reported by 29.4% ($n = 598$), and *mental health condition* was reported by 27% ($n = 548$). This was followed by *insomnia* (9.7%, $n = 198$), *arthritis/musculoskeletal* (9.3%, $n = 188$), *PTSD* (4.6%, $n = 93$), and *headache* (3.7%, $n = 75$). In all, pain and mental health conditions—*PTSD*, *mental health*, *insomnia*, *chronic pain*, *arthritis*, *headache*—accounted for 83.7% of all respondents ($n = 1700$).

Table 1 Primary conditions treated with medicinal cannabis

[Full size table](#)

Table 2 Primary symptoms treated with medicinal cannabis

[Full size table](#)

In regards to primary symptoms, *chronic pain* was reported by 58.3% ($n = 1184$), followed by *anxiety* (48.8%, $n = 991$), *insomnia* (46.2%, $n = 939$), *stress* (45.8%, $n = 929$), and *depression* (37.8%, $n = 767$).

Cannabis use

In regards to cannabis use, 74.6% ($n = 1515$) reported daily use, with a median of twice a day use (25.1%, $n = 511$). Across all primary conditions, the majority of patients reported using cannabis on a daily basis (7 days/week), as seen in Table 3. Mean amount used per day was 1.5 g, with 78.5% ($n = 1595$) of participants reporting they use less than 3 g per day, and 9.9% ($n = 201$) reporting they use 4 g or more per day.

Table 3 Frequency of daily cannabis use across all primary conditions

[Full size table](#)

In regards to primary method of use, *vaporizer (cannabis flowers/bud or nail/pen)* was cited by 31.1% ($n = 632$), followed by *joint* (30.4%; $n = 617$), *oral/edible* (16.3%, $n = 332$), *pipe* (11.3%, $n = 229$), *waterpipe*

/bong (10.4%, $n = 212$), *topical* (0.3%, $n = 6$), and *juicing* (0.2%, $n = 4$). This means that while inhalation via vaporization and/or smoking was by far the most popular methods of use, accounting for 83.2% ($n = 1690$), non-smoked methods of use (*oral ingestion, topical, and vaporization*) accounted for nearly half (47.6%, $n = 968$) of the primary methods of use.

In regards to flower cannabis (“bud”), 32% preferred hybrids ($n = 651$), 28% preferred *indicas* ($n = 569$), 24.7% preferred *sativas* ($n = 502$), and 14.8% preferred high cannabidiol (CBD) strains (1:1 CBD/THC or greater CBD content) ($n = 300$), with 0.49% ($n = 10$) citing *no preference*. This suggests that when smoking or vaporizing cannabis—which is what patients do with cannabis flower—a significant majority (84.7%; $n = 1722$) prefer strains high in THC.

However, this was not the case with orally ingested oils/extracts. Overall, 38.5% of respondents used orally ingested cannabis oils/extracts ($n = 782$), with 49.2% citing they mostly used high CBD oils/extracts ($n = 381$). Oils/extracts were used with a lower frequency than flower, with only 29.5% reporting daily use ($n = 226$), and the median frequency of use per day being once per day (65.6%; $n = 497$). Additionally, 66.5% of those who reported using oil/extracts also used flower on the same day ($n = 514$), with a breakdown of 10% extract/90% flower for 45.1% ($n = 230$), 25% extract/75% flower for 23.3% ($n = 119$), 50% extract/50% flower for 16.5% ($n = 84$), 75% extract/25% flower for 9.6% ($n = 49$), and 90% extract/10% flower for 5.5% ($n = 28$). Therefore, for most participants, oils/extracts appear to be adjunct treatments to the smoking or vaporization of cannabis flower.

When participants were asked to rank their current level of cannabis knowledge from 0 to 100 (with 1 being *no knowledge and experience at all*, and 100 being *very knowledgeable and experienced*), the mean was 73.65 (SD21.81). Interestingly, neither age nor income were significantly associated with different levels of knowledge, but there was a significant linear correlation ($r = 0.29$) with grams consumed per week and self-reported knowledge level, and higher knowledge levels were more likely to use *vape pens* and *water bongs*, while lower levels of knowledge were more likely to use *oral/extracts* ($p > .05$), suggesting that naïve or less experienced cannabis users may have had a greater level of comfort with non-inhaled, orally-ingested modes of ingestion.

Substitution for other substances

The most commonly cited substitution was for *prescription drugs* (69.1%; $n = 953$), followed by *alcohol* (44.5%; $n = 515$), *tobacco* (31.1%; $n = 406$), and *illicit substances* (26.6%; $n = 136$), as seen in Table 4. Overall, women were more likely to report substitution than men ($p < .01$; 95% CI).

Table 4 Drugs substituted with cannabis

[Full size table](#)

Participants named a total of 1730 specific prescription drugs they substituted cannabis for, 35.3% ($n = 610$) of which were opioids, 21.5% ($n = 371$) anti-depressants, 10.9% ($n = 189$) non-opioid pain medications, 8.6% ($n = 149$) anti-seizure medications, 8.1% ($n = 140$) muscle relaxants/sleep aids, 4.3% ($n = 75$) benzodiazepines, 3.4% ($n = 59$) stimulants, 1.4% ($n = 24$) anti-emetics, and 1% ($n = 18$) anti-psychotics, as seen in Table 5. Of the 610 mentions of opioid medications, participants self-reported they stopped using 59.3% completely (100% substitution) ($n = 362$), and a further 18.4% reduced their use by 75% ($n = 112$). Participants who substituted for opioids used more cannabis per day (1.71 g vs. 1.46 g by those who did not cite substitution for opioids) and were also more likely to report extract/oral use as their primary method of use (21%; $n = 458$ vs. 15%; $n = 1574$; $p = 0.01$) and to use extracts on a daily basis (40%; $n = 187$ vs. 26%; $n = 580$; $p = 0.004$). In ranking reasons for substituting cannabis for prescription drugs, the reason ranked as the “most important” by the highest number of participants was the belief that *cannabis is a safer alternative than prescription drugs* (ranked #1 by 51.2%; $n = 419$), followed by *fewer adverse side-effects* (39.7%; $n = 207$), *better symptom management* (19.5%; $n = 124$), *fewer withdrawal symptoms* (11.4%; $n = 61$), *the ability to obtain cannabis vs. prescription drugs* (3%; $n = 18$), and *social acceptance of cannabis is greater than prescription drugs* (2.4%; $n = 17$).

Table 5 Breakdown of drugs substituted with cannabis

[Full size table](#)

Of the 515 respondents who substituted cannabis for alcohol, 30.9% suggested they stopped using it completely (100%) ($n = 159$), and 36.7% reported reducing by at least 75% ($n = 189$). Participants who reported mental health symptoms were more likely to substitute for alcohol ($n = 834$; $p = .0005$), whereas participants who reported pain symptoms were less likely to substitute for alcohol ($n = 761$; $p = .002$).

Of the 406 participants who substituted cannabis for tobacco, 50.7% say they stopped using it completely (100% substitution) ($n = 206$), and 13.8% reported reducing their use by 75% ($n = 56$). Those who substituted for tobacco were far more likely to smoke cannabis as their primary method of use (66% vs. 48% of those who did not substitute for tobacco; $p < .0001$). A more detailed analysis of the tobacco substitution data from this study is the subject of a separate publication.

In regards to illicit substances, cocaine/crack was the most frequently substituted illicit drug (17.4%; $n = 89$), followed by psychedelics (11.7%; $n = 60$), non-prescription opioids (5.7%; $n = 29$), stimulants (2.7%; $n = 14$), and depressants (1.6%; $n = 8$), as seen in Table 5. Of those who cited substituting for illicit substances, 72.2% suggested they substituted at 100% for that specific drug mentioned ($n = 332$).

Discussion

This study represents the largest polling of Canadian medical cannabis patients to date, and the first broad survey of cannabis patients that we are aware of that has gathered such a detailed inventory of cannabis substitution for other drugs, including the specific prescription and illicit substances being substituted for, and the self-reported rate of that substitution as identified in quartile percentages, significantly improving the overall understanding of medical cannabis use and its impact on the use of opioids, alcohol, and other substances.

The finding that cannabis was being used for the treatment of chronic pain is in keeping with past research [45, 46], but the growing use to treat mental health conditions like anxiety, stress, and depression suggests an emerging trend in medical cannabis use [38, 47]. Despite ongoing concerns in regards to the impact of cannabis use by those with a predisposition for psychosis and schizophrenia [47, 48], the use to address more minor but widespread mental health conditions represents a potential broadening of therapeutic applications and a good target for further research [47, 49, 50].

The high frequency of daily use (74.6%) may suggest an area of concern in terms of potential long-term impacts on physical and mental health, but it is likely a reflection of the high rate of use for pain and mental health conditions, both of which are chronic conditions with daily traditional pharmacological treatment options. While daily use may pose a risk of dependence in some patients, research suggests a low risk overall. In a 2015 report titled *State of the Evidence: Cannabis Use and Regulation*, the International Centre for Science in Drug Policy assessed the state of evidence regarding the potential harms of cannabis use. They found the lifetime use of cannabis carried a low risk of dependence (9%), while the lifetime risk of dependence to alcohol has been assessed at 22.7%, and the lifetime risk of heroin dependence is estimated to be between 23.1 and 35.5% [51].

Additionally, while 52.4% of respondents cited smoking as a primary route of administration, which could result in bronchial harms [18, 22], this data also suggests an ongoing trend away from the smoked ingestion of high THC products and toward vaporization and the oral ingestion (oils or capsules) of high CBD extracts (oil or capsules) [37, 38]. This is likely due to an increase in non-smoked product options available to patients via the ACMPR, a growing awareness of the potential therapeutic benefits of CBD (particularly in regards to the treatment of mental health conditions), and a more health-conscious approach to medical cannabis use overall. However, with more and more patients around the world using cannabis for medical purposes, prospective studies will be necessary to assess the long-term health implications of chronic daily medical use, inform therapeutic considerations by patients and health care providers, and develop evidence-based treatment guidelines.

This study's findings on the self-reported reduction of opioid use are particularly significant to public health and safety. The past decade has seen the rapid growth of an opioid epidemic in North America, and currently drug overdose is the leading cause of

accidental death in Canada and the US, with many of these deaths resulting from both prescription and illicit opioids. In 2015, there were 52,404 drug overdose deaths in the USA, including 33,091 (63.1%) overdose deaths related to opioids [72]. In Canada, it is estimated that 4000 people died of an opioid overdose in 2017, 1450 of which were in British Columbia alone [52], and opioid overdose now results in an average of 16 hospitalizations per day, a 53% increase in opioid-related hospitalizations over the last 10 years [53]. Cannabis may not only reduce the prescription and use of opioids in medical and non-medical users [45, 54,55,56], it may also reduce the odds of transitioning to more problematic substances and patterns of use. Reddon et al. (2018) found that daily cannabis use was associated with slower rates of injection drug initiation among street youth in Vancouver (adjusted relative hazard 0.66, 95% confidence interval 0.45–0.98; $p = 0.038$) [57]. Furthermore, recent evidence suggests that cannabis use may reduce opioid withdrawal and improve outcomes of opioid-replacement therapies (methadone/Suboxone) for those seeking treatment for opioid use disorder [57,58,59,60], thereby reducing the public health impacts of the current opioid overdose crisis.

Concurrent with the policy trend toward the regulation and legalization of both medical and adult recreational use in many US states, Canada, and around the world is an urgent need to develop mechanisms to systematically track both the positive and negative impacts of cannabis use on individuals and society. However, this study suggests that regulating access to a standardized, quality-controlled source of cannabis for authorized patients may provide an opportunity to both reduce the harms associated with cannabis use, and to maximize the potential positive impacts on public health and safety stemming from cannabis substitution effect. Future studies involving standardized, quality-controlled cannabis will also provide more accurate assessments of not only benefits of cannabis, but potential side effects and adverse events as well.

Strengths and limitations

This study has a number of strengths and limitations. Budgetary restrictions resulted in deliberately cutting off the survey at 2032 participants, leaving open the possibility this could be an unrepresentative sample. Since this sample is drawn from a patient population registered with a medical cannabis company, respondents may be more likely to report positive effects related to the medical use of cannabis—including substitution effect—because of selection bias. All data in this study were self-reported retroactive data by patients and did not benefit from biological drug detection to confirm use or non-use of a substance, so is subject to potential recall bias. Since the **questionnaire measured “ever” use of drugs and subsequent substitution, there is no way to determine whether self-reported substitution was a temporary or lasting outcome.** However, the identification of specific prescription drugs substituted for by respondents partially mitigates this issue for this class of substances, since respondents specifically refer to substitution of an actual prescription drug, rather than a drug class like alcohol or tobacco. In light of these potential biases, the characterization of the therapeutic use of cannabis and/or cannabis substitution effect should be interpreted with caution pending replication by research that employs a more systematic recruitment approach, longitudinal monitoring, and biological drug testing.

These limitations are counterbalanced by several methodological strengths, including the large size of the sample, assurance that all participants were using a standardized, high-quality source of cannabis with the support of a health care practitioner, and adherence to established standards for reporting Internet-based surveys [61].