

Background on: Marijuana and impaired driving

Auto

March 29, 2019

IN THIS ARTICLE

Overview

Historical perspective

Marijuana impairment

Marijuana and impaired driving

Determining intoxication: "THC persistence"

State responses to marijuana-impaired driving

Impact on insurance

Charts and graphs

Additional resources

SHARE THIS



DOWNLOAD TO PDF

Overview

More states are passing legislation permitting medical and/or recreational marijuana use, which raises concerns about users driving under the influence of marijuana. This piece will discuss:

- Marijuana consumption and characteristics of marijuana impairment;

- Marijuana legalization's impact on auto accidents;
- Difficulties related to measuring user impairment; and
- Insurance impacts

Historical perspective

Marijuana is a type of hemp plant of the species *Cannabis sativa L.*, part of the genus *Cannabis L.* Unlike industrial hemp, however, marijuana contains appreciable amounts of delta-9-tetrahydrocannabinol (THC), a psychoactive cannabinoid— it's the active chemical that induces user intoxication. The plant also contains several other, non-psychoactive cannabinoids such as “cannabidiol” (CBD).

There is evidence that cannabis has been consumed for thousands of years, often for medicinal purposes. The plant **was used** as a patent medicine in the U.S. since at least 1850, when the *United States Pharmacopoeia* described the plant for the first time. Cannabis was first regulated under federal law under the **Marihuana Tax Act** of 1937.

Marijuana was subsequently subjected to countrywide prohibition under the **Controlled Substances Act of 1970** (CSA), which established a scheduling system for substances regulated under federal law. Marijuana is currently a Schedule I drug under the CSA, which defines Schedule I drugs as substances that have “no currently accepted medical use in the United States, a lack of accepted safety for use under medical supervision, and a high potential for abuse.” Other **substances** under Schedule I include heroin, LSD, and peyote.

Despite the treatment of marijuana under federal law, in 1996 California became the first state in the U.S. to pass legislation permitting a medical marijuana program. Since then, over 30 states and the District of Columbia **have passed legislation** permitting so-called “comprehensive” medical marijuana programs, which typically allow qualifying patients to access marijuana and marijuana-related products.

Since 2012, several states have also begun **passing legislation** permitting anyone over the age of 21 to possess and use marijuana, subject to certain limitations. Most of those states also have or are developing regulations for a commercial market to support recreational marijuana sales.

Marijuana impairment

The THC in marijuana plants causes intoxication in a user. (THC levels in other hemp plants are typically so low that they cannot induce intoxication.)

Effects of marijuana consumption can vary. Marijuana can affect users differently, depending on a variety of factors, including user tolerance. Common experiences while intoxicated **include** feelings of euphoria and relaxation; some may also experience heightened sensory perceptions and altered perceptions of time.

Marijuana cannot cause overdose, but can potentially cause temporary psychosis. There are **no documented instances** of an adult dying from an overdose of marijuana alone. However, in rare instances a user may experience a psychotic reaction to the drug or high levels of anxiety – in some cases, these side effects could lead a user to seek medical treatment. Such negative effects are often experienced after consuming edible marijuana products, which are often more potent and take longer to induce intoxication.

Method of consumption alters impairment profile. Several factors influence intoxication onset, intensity, and duration, including method of consumption, type of marijuana product consumed, product potency, and user characteristics.

Marijuana and related products can be consumed in several ways, including **inhalation** (either by smoking or vaporizing) of dried plant matter or concentrates (such as hashish or kief), **oral ingestion** (edibles, capsules, infusible oils), **sublingual ingestion** (lozenges), or **topical application** (lotions, salves, oils).

Smoking often causes almost immediate intoxication, with impairment typically lasting 2 to 4 hours. Intoxication onset is more delayed for other methods, sometimes up to two hours for edibles – and impairment may last much longer.

Product potency is dependent on THC levels. Potency varies considerably across marijuana products and can influence the degree of impairment. Smokable marijuana plant matter can **range** anywhere from 8 percent to 30 percent THC, whereas high-quality hash oil **could reach** up to 80 percent THC. There is **evidence** that marijuana products have become more potent over time.

User characteristics will also influence impairment. For example, chronic users may experience **less acute impairment** than non-chronic users.

Marijuana and impaired driving

Marijuana intoxication can cause impaired driving, thereby increasing the risks of accidents. Marijuana legalization is associated with an increase in impaired driving.

Marijuana impairment degrades cognition and motor skills. Marijuana alters a user's perception. As such, most studies **agree** that marijuana use results in impaired coordination, memory, associative learning, attention, cognitive flexibility, and reaction time. Driving ability is thereby degraded to some degree – but by how much remains a matter of study and is subject to several factors, including the level of impairment and user characteristics.

For example, there is **some evidence** that user impairment may also result in limited “compensatory defensive” driving, in which a user drives more carefully to compensate for a degradation in motor functioning – but this may only mitigate degradation for some skills and may not apply to non-chronic users.

Marijuana impairment increases the risk of accidents. Nonetheless, the evidence suggests that acute impairment increases the risk of traffic accidents – though the magnitude of the increased risk is still a matter of study and can vary widely, depending on the study.

One literature review **found evidence** that 20 to 30 percent of crashes involving marijuana occurred because of the marijuana use. (This compares to roughly 85 percent of crashes involving alcohol that occurred because of alcohol use.) The review estimated that the crash risk increased 22 percent while under the influence of marijuana, controlling for concurrent alcohol use.

Another review **found** that someone driving under the influence of marijuana is 1.65 times more likely to be culpable in a fatal accident.

The greater the impairment, the worse the driving abilities. As noted above, level of impairment can influence the degree to which driving ability degrades. Indeed, there is **strong evidence** that the more impaired the driver, the worse their driving abilities.

Mixing marijuana and alcohol produces additive effects. There is **evidence** that mixing marijuana and alcohol increases impairment greater than the net effects of each individual substance. There **also may exist** the possibility for alcohol to increase THC levels. Potential compensatory defensive driving is nullified when a user mixes alcohol and marijuana.

The number of “THC-positive” drivers on the road could increase after legalization. **There’s evidence** that the percentage of people driving stoned went up appreciably after Washington state legalized recreational pot. And long after legalization, a survey in Colorado **found** that almost 70 percent of marijuana consumers have reported driving stoned at least once in the past year.

Fatal crashes involving drivers who tested positive for THC have increased. Some studies **indicate** that more people with “detectable” levels of THC in their bloodstreams were involved in fatal accidents after legalization. However, as discussed below, the mere presence of THC does not necessarily indicate marijuana impairment. Furthermore, regarding fatal crash rates overall, at least one study **found** no significant annual changes in crash fatality rates for Colorado and Washington when compared to 8 control states.

A 2020 **study** by the AAA Foundation for Traffic Safety shows that the percentage of drivers in Washington involved in fatal crashes who tested positive for marijuana increased 100 percent after the state made the drug legal for recreational use. The study considered the presence of detectable THC in the blood of fatal-crash-involved drivers. In general, the presence of detectable THC in blood suggests, but does not conclusively prove, that a person has recently used cannabis.

Collision claim frequency appears to have increased. Early analysis **suggests** that states with legal recreational marijuana have higher collision claim frequencies when compared to neighboring non-marijuana states. The Insurance Institute for Highway Safety (IIHS) **found** that

collision claims frequency rose a combined 6 percent following the start of retail marijuana sales in Colorado, Nevada, Oregon, and Washington when compared to control states.

Higher risk demographics also have higher rates of marijuana-impaired driving. Younger drivers are at greater risk of traffic accidents than older drivers. Younger male drivers are at high risk of traffic accidents. **Early evidence** suggests that younger male drivers are most likely to drive under the influence of marijuana.

Use of recreational marijuana impairs driving even when the driver is not high. A **study** published in the journal Drug and Alcohol Dependence suggests that chronic, heavy use of recreational marijuana impairs driving skills even when the driver is not high. The researchers used a driving simulator to evaluate the potential impact of cannabis use on driving performance. The study concluded that driving impairment was significantly worse among the study participants who began using marijuana regularly before age 16. The study, by researchers at Harvard Medical School's McLean Hospital, found that cannabis users hit more pedestrians, exceeded the speed limit more often, and drove through more red lights compared with non-users. At the time of the study, the marijuana users had not used for at least 12 hours and were not intoxicated.

Determining intoxication: “THC persistence”

A key issue raised in many studies examining the effects of marijuana-impaired driving and its risks is “THC persistence.” Unlike alcohol, THC levels in a user's body may not be an accurate indication of impairment.

Compared with marijuana, determining alcohol intoxication is relatively straightforward. The human body processes alcohol at a rate that allows blood alcohol concentration (BAC) to closely correlate with intoxication, making it an effective and accurate benchmark for **measuring impairment**.

THC presence does not necessarily indicate impairment. The human body processes THC differently than alcohol. As the AAA **noted** in a major 2016 study, THC can remain in a user's blood or urine for weeks after they consume marijuana, depending on various factors. Furthermore, THC levels spike immediately after consumption, but decline to low levels very quickly – long before impairment ends. It is therefore not currently possible to accurately determine when a user consumed marijuana based on the THC levels in their body.

Additionally, the length and intensity of intoxication depends not only on the strength of the marijuana product, but also on how the drug is consumed. Inhaling marijuana typically causes onset of intoxication within five minutes, with symptoms of intoxication lasting a couple of hours. On the other hand, ingesting marijuana (e.g. “special brownies”) can delay onset of intoxication between one to four hours, and **intoxication** can last much longer than that.

These and other reasons led the AAA to conclude that “simply detecting any THC does not therefore indicate impairment.”

A U.S. National Highway Traffic Safety Administration (NHTSA) [report](#) came to similar conclusions, noting that most studies have found that levels of THC do not closely correlate to the degree of impairment – and that often peak impairment occurs when THC levels have already begun to decline.

In sum, THC detection in a user post-accident does not necessarily mean that marijuana impairment contributed to a traffic accident.

There is no agreed-upon impairment limit. As noted above, greater impairment leads to worse driving skills. There is [some evidence](#) that higher blood THC concentrations are associated with a driver’s culpability in an accident. However, there is [no agreed-upon impairment limit](#) above which an individual is indisputably impaired.

State responses to marijuana-impaired driving

Some states enforce *per se* limits on THC concentrations. Nonetheless, several states currently enforce *per se* limits to determine marijuana impaired driving, typically 5 ng/ml of THC, though the limit in some states is as low as 1 ng/ml. Operating a vehicle with blood THC concentrations above the *per se* limit is illegal. Colorado enforces a “reasonable inference” standard, in which any THC concentration above 5 ng/ml can be inferred to indicate impairment. (Other states enforce a zero-tolerance policy for THC – any level of THC is prohibited.)

However, *per se* limits have been criticized for their potential to incriminate drivers who are not impaired, since THC can persist for long periods of time in a user. Unfortunately, the opposite may also be true: impaired drivers may not always be prosecuted, since high levels of THC quickly leave the bloodstream before impairment subsides. One study [found](#) that only 10 percent of its participants would have been prosecuted for impaired driving, even though many self-reported recent marijuana use.

Furthermore, the time between a roadside traffic stop and subsequent blood testing could take hours, making potential impairment difficult to measure since THC levels might have declined long before testing.

The AAA [has therefore concluded](#) that “a quantitative threshold for *per se* laws for THC following cannabis use cannot be scientifically supported.”

Other states use “behavioral evaluations” to help determine impairment. Several states [prohibit](#) a driver from being under the influence of THC. In these states, determining whether a driver was marijuana-impaired depends on a variety of evidence, including behavioral evaluations of the driver by a law enforcement officer.

There is currently no scientifically-sound roadside impairment test. There is currently [no “breathalyzer”-equivalent](#) for marijuana impairment, in part due to the various difficulties of scientifically measuring impairment outlined above. Some have argued that saliva testing may

help in determining THC-levels during a roadside stop, but others have argued that the mere presence of THC still cannot consistently and scientifically determine impairment.

Impact on insurance

Personal auto: the standard personal auto policy does not address driving under the influence of any drug, including alcohol and marijuana. However, auto insurance rates may be impacted by the spread of marijuana legalization, particularly if such legalization is associated with an appreciable increase in impaired driving and related accidents. An individual's auto insurance rates may rise if they are convicted of driving under the influence of marijuana. Risky driving behavior may also influence rates.

Commercial auto: the standard commercial auto policy also does not address driving under the influence of drugs. However, the [U.S. Federal Motor Carrier Safety Administration](#) (FMCSA) governs the drug and alcohol testing rules and regulations for employees driving vehicles that require a commercial driver's license (CDL).

The FMCSA requires employers to test a prospective employee for drugs, [including marijuana](#), before permitting the individual to operate a commercial motor vehicle (CMV). The FMCSA may also require post-accident drug testing in the event of certain vehicle accidents, including those that result in a human fatality.

Random testing throughout the year is also required for CDL operators. Any CMV operator who is under the reasonable suspicion of being under the influence of drugs can be tested immediately. An operator who fails a drug test [is prohibited](#) from operating a CMV. The FMCSA prescribes a "return-to-duty" process for such an operator.

Of note, the U.S. Department of Transportation (DOT) has [stated](#) that a drug test cannot be verified as negative based on the fact that an employee has been certified to use medical marijuana: "It remains unacceptable for any safety-sensitive employee subject to drug testing under the Department of Transportation's drug testing regulations to use marijuana."

Charts and graphs

Additional resources

American Automobile Association, [“Overview of Major Issues Regarding the Impacts of Alcohol and Marijuana on Driving”](#)

Governors Highway Safety Association, [“Drug Impaired Driving”](#)

National Association of Insurance Commissioners, [“Cannabis and Insurance”](#)

National Conference of State Legislatures, [“Drugged Driving – Marijuana-Impaired Driving”](#)

U.S. Department of Transportation, National Highway Traffic Safety Administration, [“Marijuana-Impaired Driving”](#)

© Insurance Information Institute, Inc. - ALL RIGHTS RESERVED

[Back to top](#)

You May Also Like

COMMERCIAL

Spotlight on: marijuana and employment

AUTO

A rocky road so far: Recreational marijuana and impaired driving