Driving Under the Influence of Cannabis: Forensic Issues

Laurence M. Westreich, MD; Gregory L. Iannuzzi, MD; Neil S. Kaye, MD
Addictions Committee

Cannabis laws in the United States are rapidly changing. Differences in regulatory status between states are creating a confusing patchwork of laws with few legal precedents. Law surrounding driving under the influence of cannabis is especially convoluted. In states with legal use, law enforcement must balance keeping roads safe with respecting the rights of adults to use cannabis. In this discussion, we will highlight several issues related to the effects of cannabis on driving and legislative approaches to these issues.

State policies with respect to cannabis and driving vary widely. (1) The Insurance Institute for Public Safety maintains a listing of state marijuana laws. (2) A similar compilation focused on marijuana-impaired driving laws can be found at the National Alliance to Stop Impaired Driving. (3) The most draconian "zero-tolerance" states (Arizona, Delaware, Georgia, Indiana, Iowa, Michigan, Oklahoma, Pennsylvania, Rhode Island, South Dakota, Utah, and Wisconsin) consider any positive drug test, including delta-9 tetrahydrocannabinol (THC), to be evidence of intoxication. Five states have *per se* laws, which establish a legal THC limit of between 2 and 5 ng/mL, and automatically define any person who tests above that level as intoxicated. Colorado has a "reasonable inference" law, which allows drivers who are above the 5 ng/mL limit to present an affirmative defense that, despite the level of THC in their body, they were not in fact intoxicated. The Massachusetts legislature considered a bill – named after a state trooper killed by an allegedly marijuana-intoxicated driver – which would have equalized alcohol and marijuana impairment cases, suspended the license of any driver who declines a requested chemical test, and explicitly allowed the testimony of Drug Recognition Experts (DREs).

(4) However, the bill stalled after lawmakers complained that there is no reliable method to assess cannabis intoxication. (5)

Toxicologic determination of THC levels has been stymied by the lack of reliable roadside testing. Although 24 states have statutes authorizing the use of oral fluid specimens for roadside testing, only a few have actual programs in place. (6) Alabama and Indiana regularly conduct these tests; Michigan has a program in five counties; and Colorado ran an oral testing program during the years 2015-2018. Furthermore, there is no clear, agreed-upon toxicological standard for driving while under the influence of cannabis. This contrasts with the nationally accepted standard for alcohol intoxication of 0.8 mg/dL.

Cannabis differs from alcohol in several important ways, which has impeded development of toxicologic measures of intoxication. Cannabis contains multiple different compounds which may modulate the level of intoxication in the user. These substances include THC, cannabidiol (CBD), and other substances which are less well studied. (7) Cannabinoids remain detectable long after the effects of acute intoxication have resolved. These nuances in pharmacology make roadside toxicological testing substantially less useful for identifying impaired drivers than roadside tests for alcohol. Toxicologists testifying regarding accusations of cannabis-impaired driving can expect questions on the practical meaning of measured THC levels. One judge (8) suggested that these questions would include, among others:

1. Is there a set THC blood concentration that equates to marijuana driving impairment?
2. Do Standard Field Sobriety Tests (SFSTs) apply to marijuana driving impairment?
3. What was the potency of the marijuana used?
4. How do age, gender, weight, dosage, use, tolerance, metabolism, ingested food, absorption, distribution, and excretion rate of THC affect impairment?

Although the techniques for law enforcement officers recognizing and documenting drug intoxication are nowhere near as codified as those for identifying alcohol intoxication, a substantial body of knowledge does exist. For instance, the certification of Drug Recognition Experts (DREs) is under the aegis of the International Association of Chiefs of Police (IACP), with support from the National Highway Traffic Safety Administration and the U. S. Department of Transportation. (9) Certification is earned in three phases, including a "pre-school" of 16 hours, the DRE School lasting 56 hours, and field certification requiring 40 hours. This rather substantial process allows the expert – usually a police officer – to deliver an expert opinion as to 1. whether a particular examinee was so impaired that he or she should not operate a motor vehicle, 2. if the impairment was due to drug use, an injury, or a medical problem, and 3. which drug or category of drugs would be most likely to cause the impairment. The DRE arrives at those opinions by performing a breath alcohol test, an interview and directed physical examination of the individual involved, and sometimes requests further toxicological testing. Although the physical examination results for the use of stimulants or opioids are arguably more distinct than those for cannabinoids, the DRE is instructed to look for a lack of eye convergence and an inability to shift attention by the person intoxicated with cannabinoids.

Laboratory studies clearly demonstrate that cannabis use impairs behaviors necessary for good driving, including psychomotor skills, divided attention, lane tracking, and various cognitive functions. (10) It is less clear to what extent these behaviors

Cannabis

are impaired in habitual cannabis users versus cannabis-naïve individuals. (11) The net effect of cannabis-induced behavior changes on driving safety is also uncertain. Studies using driving simulator tests "have shown that drivers who are high on marijuana react more slowly, find it harder to pay attention, have more difficulty maintaining their car's position in the lane and make more errors when something goes wrong than they do when they're sober. But such tests have also shown marijuana-impaired drivers are likely to drive at lower speeds, make fewer attempts to overtake and keep more distance between their vehicle and the one ahead of them" (Ref. 12, para. 6). This demonstrates that cannabis intoxication may result in a variety of changes in driving behavior.

Other data suggests that cannabis has a negative impact on highway safety. One insurance industry study examined the effect of cannabis legalization in four states through 2019 and found that cannabis legalization was associated with a statistically significant 3.8% increase in collision claim frequency, as well as injuries to people. (13) In another study, analysis of drug tests done on the drivers involved in Washington fatal car crashes from 2008 to 2019 showed that the proportion of drivers positive for THC approximately doubled after the legalization of recreational cannabis in December 2012. (14) Although the authors found that the proportion of drivers with high THC levels also increased, they acknowledged that the base rate of cannabis use had increased, and that the heavier cannabis use was statistically *associated* with fatal car crashes, rather than necessarily *causative* of those crashes. Several reviews of large data sets suggest that the combination of alcohol and cannabis intoxication confers greater risk than driving under the influence of either substance alone (15,16), an important consideration given the frequent combined use of these substances. (17)

Many key issues remain to be determined in the evolving landscape of cannabis law. Medicine has yet to reach a consensus on several basic principles regarding cannabis use and intoxication, such as how to reliably correlate the presence of cannabinoids with changes in cognition and motor activity, how these psychological changes affect driving behavior, and how these changes in driver behavior affect safety. Scientists in other disciplines similarly continue to clarify the net impact of cannabis use on road safety. Regardless of the state of the science, lawmakers are tasked with enacting laws to protect citizens in the context of mounting public pressure to decriminalize cannabis use. Forensic psychiatrists bridge the divide between these disparate entities, and it is our hope that this article will encourage them to participate in the discussion.

References:

(1) [No author] Drugged Driving/Marijuana-Impaired Driving. National Conference of State Legislatures (NCSL), September 9, 2021. https://www.ncsl.org/research/transportation/drugged-driving-overview.aspx. Accessed May 14, 2022.

(2) [No author] Marijuana laws by state. Insurance Institute for Highway Safety - Highway Loss Data Institute. May 2022. https://www.iihs.org/topics/alcohol-and-drugs/marijuana-laws-table. Accessed May 2022.

(3) [No author] State laws. National Alliance to Stop Impaired Driving. https://nasid.org/state-laws. Accessed May 14, 2022.

(4) Commonwealth of Massachusetts, House Docket No. 4586, House No. 4255, Filed November 10, 2021. https://malegislature.gov/Bills/192/HD4586.Html. Accessed May 14, 2022.

(5) Young C. Family of fallen Massachusetts State Police trooper pushes for passage of law in his name. WCVB 5. February 8, 2022. https://www.wcvb.com/article/push-for-trooper-thomas-clardy-law-february-8-2022/39018130. Accessed May 14, 2022.

(6) Bloch S. States Explore Oral Fluid Testing to Combat Impaired Driving. National Conference of State Legislatures LegisBrief, May 2021. https://www.ncsl.org/Portals/1/Documents/legisbriefs/2021/May%20LBs/Oral-Fluid-Testing.pdf. Accessed May 14th, 2022.

(7) Cole TB, Saitz R. Cannabis and Impaired Driving. JAMA. 2020;324(21):2163-2164. doi:10.1001/jama.2020.18544

(8) Celeste, MA. A judicial perspective on expert testimony in marijuana driving cases. J. Med. Toxicol. (2017) 13; 117-123

(9) [No author]. Investigation and prosecution of cannabis-impaired driving cases. National District Attorney Association. July 2020. https://ndaa.org/wp-content/uploads/Investigation-and-Prosecution-of-Cannabis-Impaired-Driving-Cases-Final.pdf. Accessed May 14th, 2022.

(10) Hartman RL, Huestis MA. Cannabis effects on driving skills. Clin Chem. 2013;59(3):478-492. doi:10.1373/clinchem.2012.194381

(11) Brooks-Russell A, Brown T, Friedman K, et al. Simulated driving performance among daily and occasional cannabis users. Accid Anal Prev. 2021;160:106326. doi:10.1016/j.aap.2021.106326

(12) [No author]. Crash rates jump in wake of marijuana legalization new studies show. Insurance Institute for Highway Safety. June 17, 2021. https://www.iihs.org/news/detail/crash-rates-jump-in-wake-of-marijuana-legalization-new-studies-show. Accessed May 14th, 2022.

(13) [No author]. Recreational marijuana and collision claim frequencies. Highway Loss Data Institute Bulletin Vol. 37, No. 20. December 2020. https://www.iihs.org/media/f5fb46ff-d4b7-47b5-9c2c-951f2a30e0a6/8W5rpg/HLDI%20Research/Bulletins/hldi_bulletin_37-20.pdf. Accessed May 14th, 2022.

(14) Tefft BC, Arnold LS. Estimating Cannabis Involvement in Fatal Crashes in Washington State Before and After the Legalization of Recreational Cannabis Consumption Using Multiple Imputation of Missing Values. Am J Epidemiol. 2021;190(12):2582-2591. doi:10.1093/aje/kwab184

(15) Sewell RA, Poling J, Sofuoglu M. The effect of cannabis compared with alcohol on driving. Am J Addict. 2009;18(3):185-193. doi:10.1080/10550490902786934

(16) Lira MC, Heeren TC, Buczek M, et al. Trends in Cannabis Involvement and Risk of Alcohol Involvement in Motor Vehicle Crash Fatalities in the United States, 2000–2018. Am J Public Health. 2021;111(11):1976-1985. doi:10.2105/AJPH.2021.306466

(17) Gunn RL, Aston ER, Metrik J. Patterns of Cannabis and Alcohol Co-Use: Substitution Versus Complementary Effects. Alcohol Res. 2022;42(1):04. Published 2022 Feb 10. doi:10.35946/arcr.v42.1.04