



## IMPAIRED DRIVING COALITION OF CANADA

### Alcohol, Other Drugs & Driving Know the Facts

TRAFFIC INJURY RESEARCH FOUNDATION, SEPTEMBER 2023

#### Alcohol, Other Drugs & Driving: Know the Facts

Obtaining a driver's licence is often a source of excitement and celebration because it brings independence. But a driver's licence does not make you invincible in a collision.

Road crashes are a leading source of death for young people. Young drivers are 5-10 times more likely to be fatally injured than any other age group (Reniers et al., 2016). Generally, they overestimate their driving skills and abilities, while underestimating the risks and hazards in different road environments.

From an early age, males take more risks than females because young males are less likely to believe they will be hurt. Males are also more likely to believe injuries are a result of bad luck instead of impulsive behaviours (Bukis, Lenne, & Fitzharris, 2015).

Most of all, young males underestimate the risks associated with certain behaviours, such as consuming alcohol and drugs other than alcohol<sup>1</sup>, and using their phone while driving (Reniers et al., 2016).

#### Why do people drive impaired?

Many people cannot accurately gauge their level of impairment and ability to drive after drinking or consuming cannabis. This is because they tend to focus on impairment in physical movements, such as staggering or swaying instead of impairment in thinking such as unclear thinking, poor decision-making and inability to focus on a task or anticipate risks which are common factors in alcohol-related crashes (Sober Smart Driving, 2020). Many drivers do not recognize the impairing effects of alcohol on driving or the risk they pose to themselves and other drivers on the road.

In addition, people mistakenly believe they are okay to drive when they stop drinking and begin to feel better. But in truth they are still impaired, and their level of impairment continues to rise after their last drink even though they may not feel that different. Similarly, people also over-estimate their ability to perform tasks as impairment begins to decline and this is because they feel less impaired than they did

previously, however, they still are not sober. A 2007 study found impairment was most evident as blood alcohol concentrations (BACs) were rising, but heavy drinkers perceived themselves to be less impaired than light drinkers (Brumback, Cao, & King, 2007). Further, many drinkers inaccurately estimate their intoxication, specifically persons who drink more and have higher BACs tend to underestimate their BAC on average (Brown et al., 2016; Cameron et al., 2018).

Research also shows women will drive impaired due to personal safety concerns. Their perceptions of safety can discourage them from relying on public transportation, using ride-sharing or ride-sourcing alternatives, or accepting rides from persons they do not know well (Robertson & Ireland, 2016).

## How does alcohol affect driving skills?

Alcohol is absorbed into the bloodstream as it is consumed, circulating through the body to the brain. As the level of alcohol in the blood increases, so do the impairing effects. Initial effects of alcohol which can occur following one drink include sleepiness and relaxation which impairs judgement but is often unnoticed by the drinker. These effects result in unclear thinking or assessment of situations, poor decisions and being more likely to engage in behaviours or take risks which would typically be avoided. Small amounts of alcohol also affect muscle control, slow reaction times, and decrease motor coordination. Vision can also be affected due to the small muscles in the eye being very susceptible to the effects of alcohol.

As the amount of alcohol consumed increases, impairing effects become more obvious. After one standard drink (.02 BAC), drivers typically have difficulty performing divided attention tasks such as driving and anticipating hazards. Three standard drinks (.05 BAC) make it more challenging to steer and track other vehicles. After four drinks (.08 BAC), drivers have difficulty controlling speed and have trouble concentrating on a task. Problems staying within a lane and slower braking are common after four standard drinks (BAC .10).

BAC	TYPICAL EFFECTS	PREDICTABLE EFFECTS ON DRIVING
.02	<ul style="list-style-type: none"> <li>&gt; Some loss of judgement</li> <li>&gt; Relaxation</li> <li>&gt; Altered mood</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Difficulty performing divided attention tasks such as driving and anticipating hazards</li> <li>&gt; Decline in visual function</li> </ul>
.05	<ul style="list-style-type: none"> <li>&gt; Exaggerated behaviour</li> <li>&gt; Loss of small muscle control</li> <li>&gt; Impaired judgement</li> <li>&gt; Lowered alertness</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Reduced coordination</li> <li>&gt; Difficulty steering and tracking other vehicles</li> <li>&gt; Reduced response to emergency situations</li> </ul>
.08	<ul style="list-style-type: none"> <li>&gt; Muscle coordination becomes poor</li> <li>&gt; Harder to detect danger</li> <li>&gt; Judgment, self-control, reasoning and memory are impaired</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Difficulty controlling speed</li> <li>&gt; Reduced concentration</li> <li>&gt; Impaired perception</li> </ul>
.10	<ul style="list-style-type: none"> <li>&gt; Clear deterioration of reaction time and control</li> <li>&gt; Poor coordination</li> <li>&gt; Slowed thinking</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Difficulty staying in lane</li> <li>&gt; Difficulty braking</li> <li>&gt; Slow reaction time</li> </ul>
.15	<ul style="list-style-type: none"> <li>&gt; Major loss of balance</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Blurred vision</li> </ul>

Sources: Steer Clear of Impairment (TIRF, [https://tirf.ca/download/dwi\\_steer\\_clear\\_impairment\\_infographic\\_dwiwg2018](https://tirf.ca/download/dwi_steer_clear_impairment_infographic_dwiwg2018)); Saskatchewan Driver's Handbook (SGI, [https://sgi.sk.ca/handbook/-/knowledge\\_base/drivers/introduction](https://sgi.sk.ca/handbook/-/knowledge_base/drivers/introduction))

## How does cannabis affect driving skills?

Cannabis can reduce situational awareness and make it harder to focus on a complex task such as driving. This means the ability to anticipate or recognize hazards and react to them can be slower. It can also cause paranoia, drowsiness, and distorted perceptions of time and distance, resulting in disorientation and driving errors.

Research investigating the effects of cannabis on driving skills shows it can specifically impair certain skills necessary for safe driving (Hartman et al., 2012; Compton 2017; Battistella et al., 2013; Alvarez et al., 2021), such as:

- > maintaining a consistent speed
- > keeping the vehicle centred in the lane
- > slower reaction times
- > problems dividing attention between visual, manual and cognitive driving tasks
- > staying focused on the driving task
- > planning a route to drive
- > making decisions behind the wheel to respond to a changing road environment
- > risk-taking

Other research reviewing cannabis-related behavioural studies (Malhotra, Starkey, & Charlton, 2017) showed cannabis was associated with reckless driving and speeding, signalling errors, and decreased ability to visually track objects (i.e., the ability to visually follow a moving object) on the road.

### Does cannabis affect people in the same way?

Since cannabis is absorbed in fat tissue, the time it takes for the body to absorb, circulate, and eliminate it varies. Several factors affect this process including how the drug is consumed, how frequently it is used, the amount of THC<sup>2</sup> in it, how quickly the body absorbs it when smoked or vaporized, and individual characteristics of users (such as age, sex, fatigue). Not only do these factors affect the amount of cannabis ingested and metabolized, but they also affect the level of behavioural impairment that users experience (Lyon & Robertson, 2020).

### Is the level of impairment affected by how cannabis is consumed?

Unlike alcohol, the impairing effects of cannabis vary depending on how it is consumed. THC levels in the blood can vary widely based on whether cannabis is smoked versus consumed as oil or edibles. They can also vary depending on the potency of the product and individual biological characteristics (Compton, 2017). This means impairing effects can vary according to specific types of cannabis products consumed and individual biology.

- > **Smoking or vaping.** Cannabis smoke or vapour delivers THC (the chemical that produces impairment) into your lungs where it passes directly into your bloodstream and then your brain. When inhaling cannabis, users feel the effects within a few seconds to a few minutes of inhaling and full effects can peak in about 30 minutes. The effects can last up to 6 hours after use and some residual effects can last up to 24 hours (CCSA, 2019).



- > **Eating or drinking.** Cannabis edibles pass through the stomach, then the liver before reaching the bloodstream and brain. The liver changes THC into a stronger form and this form combined with the THC from the original product adds to the intensity of the high. This may be part of the reason edibles with greater amounts of THC can feel more intoxicating than other cannabis products, even if the dose consumed is the same. When ingesting cannabis, users feel the effects from 30 minutes to 2 hours after consuming it and full effects can peak within 4 hours. The effects can last up to 12 hours after use and some residual effects can last up to 24 hours (CCSA, 2019).

### How does combining cannabis and alcohol affect driving skills?

When drivers combine cannabis and alcohol the impairing effect on brain function is far greater than the impairing effect of just one or the other. Consuming both alcohol and cannabis produces impairing effects that are additive. The way each drug impairs driving does not completely overlap, meaning the combined use results in a greater level of impairment even at low doses of alcohol. For example, while a breath test result would only indicate the level of alcohol consumed, mixing it with cannabis results in much greater impairment of the central nervous system which would be equivalent to a much higher alcohol level. Aside from cannabis, the combination of alcohol with other drugs, both illegal and prescribed medications, can increase impairment. Combining drugs and alcohol can produce a multiplying effect and it has an unpredictable effect on driving.

NUMBER OF DRINKS	COMBINED WITH	EQUIVALENT TO NUMBER OF DRINKS
2	Cannabis (1 joint)	= 5 to 6
2	Antihistamine (cold remedy)	= 4 to 5
2	Tranquilizer (Valium, normal dose)	= approximately 6
2	Gravol	= approximately 6

Source: Saskatchewan Driver's Handbook (SGI, [https://sgi.sk.ca/handbook/-/knowledge\\_base/drivers/introduction](https://sgi.sk.ca/handbook/-/knowledge_base/drivers/introduction))

### How many teens and young adult drivers die in road crashes involving alcohol & drugs?

Alcohol and drugs are common in fatal road crashes involving drivers under 35 years old. According to TIRF's National Fatality Database (Brown et al., 2023), between 2016 and 2020:

- > More than 1 in 4 (or 26%) young drivers aged 16-19 years killed in road crashes tested positive for alcohol.
- > More than 2 in 5 (or 42%) young drivers aged 20-24 years killed in road crashes tested positive for alcohol.
- > Even larger percentages of young drivers killed in road crashes tested positive for drugs, with cannabis being the most common drug detected.
- > Approximately half (48%) of young drivers aged 16-19 years killed in road crashes tested positive for drugs and 38% tested positive for cannabis post-legalization.
- > More than half (55%) of drivers aged 20-24 years killed in road crashes tested positive for drugs and 41% tested positive for cannabis post-legalization.

### Why is it important for passengers to speak up if the driver is impaired?

Passengers of a driver who has consumed alcohol and/or drugs are equally at risk for injury or death. Almost one in five persons (18.5%) killed in alcohol-related crashes in Canada in 2016 was a passenger (TIRF, 2020). The 2020 Canadian Cannabis Survey (Health Canada, 2021) asked Canadians if they had been a passenger in a vehicle driven by someone within two hours of using cannabis. Overall, 23% of people reported having ever been a passenger in a vehicle driven by someone who had recently used cannabis. Provincial and territorial estimates of ever being a passenger in a vehicle driven by someone who had used cannabis within two hours of driving ranged from 18% to 38% (Health Canada, 2021).



Just like drivers, passengers consuming alcohol or drugs can also be impaired. This can result in passengers making poor decisions and taking risks they would otherwise avoid. For example, they may fail to recognize how much the driver has consumed, or simply be unconcerned about the risk of riding with them. This speaks to the importance of planning ahead and making arrangements if you plan to consume alcohol or drugs. Several safe ride programs provide free or low-cost rides to alcohol-impaired passengers. These programs are intended to reduce alcohol-related driving, crashes and casualties and offer people a safe option to get home. Generally, these programs are community-based in response to an immediate need to overcome limited transportation options and reduce impaired driving (Barrett et al., 2017).

As a passenger, your life is in a driver's hands. While speaking up is not easy and can be scary, it can be necessary to protect yourself and others. If you believe a driver cannot drive safely or poses a risk to others on the road, it is okay to refuse a ride from them and speak up to discourage them from driving.

### Is it possible for police to detect cannabis and other drugs?

**Yes.** If a police officer observes a driver weaving, drifting, failing to comply with traffic signals or displaying reckless or aggressive driving (e.g., speeding, failing to stop at stop signs or traffic lights, following too close to other cars, etc.) or similar behaviours, they can stop a driver and conduct an impaired driving investigation. During the investigation, officers may observe additional signs of impairment during their interaction with a driver (e.g., slurred speech, inability to follow directions, poor motor coordination and odour of alcohol and/or drugs). This evidence permits them to demand drivers to exit their vehicle and submit to further testing which may include Standardized Field Sobriety Tests (SFSTs) and/or a demand for a bodily fluid sample as well as an examination by a Drug Recognition Expert.

### What is Mandatory Alcohol Screening (MAS) in Canada?

In December 2018 changes to the Criminal Code of Canada removed reasonable suspicion as a requirement to request a driver provide an alcohol breath test. This enables police to demand a breath test from any driver, even without suspicion or cause. Under common or provincial law, this would only be done after the person has been lawfully stopped. MAS is a proven traffic safety measure designed to deter and better detect alcohol-impaired drivers (Government of Canada, 2021).

### What are the consequences of impaired driving for new drivers?

Administrative consequences. New drivers in a Graduated Driver Licensing (GDL) program must have no alcohol in their blood when driving until they are 21 years of age. Administrative consequences include a licence suspension, although the length of the suspension varies by province and territory, and vehicle seizure, again length of time varies by province and territory (CCSA, 2020).



The consequences of an impaired driving conviction are more significant for new drivers. In many jurisdictions across Canada, young impaired drivers are frequently subject to the same traditional penalties that are applied to adult offenders (e.g., fines, probation, community service, treatment, and incarceration).

- > **Licence suspensions.** Youth convicted of impaired driving are subject to some licence suspension and any related remedial programming. For example, youth convicted in Ontario are required to successfully complete the Back on Track program as a condition of licence reinstatement.
- > **Fines.** In Canada, when a youth is sentenced to pay a fine, they are required to pay a specific amount to the court that does not exceed \$1,000. In general, fines for traffic offences among youth are typically \$500. These fines do not include other costs associated with being charged, such as a licence reinstatement fee which can cost upwards of \$200 depending upon the jurisdiction.
- > **Probation.** Compulsory conditions of probation include keeping the peace and appearing in court when required to do so. A judge may impose additional conditions such as a curfew, requiring a youth to report to a probation officer and abstain from alcohol or drugs. The average length of a probation order is ten to 12 months.
- > **Community service.** A judge has discretion to impose a community service order of up to 240 hours with a maximum completion term of 12 months. These orders are often overseen by community organizations, such as the John Howard Society, that have youth attendance/ intervention centres which provide structured and supervised programming.
- > **Removal.** After three convictions or condition violations, novice licences are cancelled, any existing fees paid or credit earned for experience are forfeited and drivers must re-apply as a new driver.

## What is serotonin syndrome and is it affected by cannabis and alcohol?

Serotonin is a neurotransmitter, meaning it helps relay messages between different regions of the brain. Serotonin syndrome can occur when starting to take a new drug (whether prescribed or otherwise) or the dose of a certain medication is increased. It is most often caused by combining medications that contain serotonin (i.e., migraine medication and an antidepressant) (Mayo Clinic, 2020). Cannabis (such as edible) with a high CBD concentration can increase the level of serotonin and when combined with an antidepressant, for example, can lead to serotonin syndrome. Alcohol can also increase serotonin levels temporarily, which raises the odds of serotonin syndrome.

Serotonin syndrome symptoms usually occur within several hours of taking a new drug or increasing the dose of a drug you're already taking. Symptoms of serotonin syndrome include (Mayo Clinic, 2020):

- > confusion
- > agitation or restlessness
- > loss of muscle coordination
- > headache
- > muscle rigidity
- > rapid heart rate
- > dilated pupils

These symptoms are in addition to any impairment of alcohol and cannabis. Like when cannabis and alcohol are combined, serotonin syndrome will produce an additive effect, deepening the level of impairment.

## How can you prevent alcohol and cannabis-impaired driving?

It is important to understand the risks and consequences of impaired driving and recognize that an impaired driver is not an option for a safe ride home. Planning for a safe ride home should happen prior to drinking alcohol or cannabis consumption because the impairing effects can result in poor decision-making. Speaking up can be difficult, but if you believe a driver cannot drive safely it is okay to refuse a ride from them and discourage them from driving.

<sup>1</sup>Alcohol is a drug and is the most commonly used substance. Specifically, alcohol is a Psychotropic Central Nervous System (CNS) Depressant. Being a "psychotropic" drug means alcohol has an impact on cognition, emotions, and perception. Alcohol shares this designation with many other well-known drugs, such as Marijuana, Cocaine, and LSD (CAMH, 2023).

<sup>2</sup>The primary psychoactive component of cannabis is delta-9-tetrahydrocannabinol, commonly known as THC. THC and its psychoactive metabolite, 11-hydroxy-THC or 11-OH-THC, and primary inactive metabolite, 11-nor-9-carboxyTHC or THC-COOH are frequently measured in biological fluids to document cannabis intake.

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## TRAFFIC INJURY RESEARCH FOUNDATION

The vision of the Traffic Injury Research Foundation (TIRF) is to ensure people using roads make it home safely every day by eliminating road deaths, serious injuries and their social costs. TIRF's mission is to be the knowledge source for safe road users and a world leader in research, program and policy development, evaluation, and knowledge transfer. TIRF is a registered charity and depends on grants, awards, and donations to provide services for the public. Visit [tirf.ca](https://tirf.ca).



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TIRF & Diageo North America formed the IDCC to tackle impaired driving in Canada.

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