



UNIVERSITY OF
CALGARY

Legalized cannabis: *what does it mean?*

Canada is legalizing cannabis. But there's still much we don't know about what benefits and drawbacks we can expect. Our researchers study the legal, medical, cultural and social impacts of mainstream marijuana – what's good, what's less good, and what we need to learn more about.

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How much will legalized pot cost?

Cannabis legalization and how it will affect our governments, our laws, and our way of life

UCalgary researchers explore the social side of cannabis legislation, including policy, law, and on-campus life.

By Mike MacKinnon

In 2015, the federal government announced it was going to legalize cannabis. Some of the reasons were to regulate cannabis and restrict access, to eliminate the black market, to ease the burden on the courts, to reduce the number of criminal records, and to tax production and sale.

Other levels of government were left wondering how they were going to handle such a huge social change. Legalization involves more than simply changing laws. It means implementing an entirely new production, distribution and regulatory system for a product that used to be illegal, and then dealing with the social consequences.

For the average person, legalization means navigating a new regulatory regime involving everything from retail licensing to driving to where cannabis can be consumed.

In Alberta, the provincial government approached

UCalgary's Health Technology Assessment (HTA) Unit, part of the O'Brien Institute for Public Health in the Cumming School of Medicine. The HTA unit evaluates things like new processes, technologies and systems in health care, and makes policy recommendations to the government.

"They said, 'we need all the evidence you can possibly give us to help us make this policy,'" says Dr. Fiona Clement, PhD, director of the HTA unit.

Over several months, Clement's team compiled all the information they could find into a 286-page report called *Cannabis evidence series: an evidence synthesis*. The report looked at everything from the current landscape to health issues to what happened in other jurisdictions that legalized cannabis.

"We started with a list of questions we thought the government needs answers to," says Clement. "What are other jurisdictions doing, and how is it working out

for them?’ ‘How do they compare to Canada?’ ‘What are the health risks?’ ‘What are the regulations for producers and sellers?’ ‘What about advertising?’ ‘How much should it cost?’”

The last question about cost may seem less important than other considerations. But if part of the rationale for legalization is to wipe out the black market, then legal retailers need to be competitive on price. Charge too much, and users will continue to buy from their current sources. Charge too little, and the government risks being unable to cover the significant costs that come with legalization.

“Finding the optimal price point to switch people away from the black market is a balancing act,” says Clement. “Legal cannabis is probably going to cost more than on the black market. Maybe people would pay a dollar more per gram, but would they pay ten dollars more per gram?”

Clement says it’s hard to accurately gauge the market value of an illicit product. “The government doesn’t have a good handle on the cost of cannabis in the illegal market,” she says. “It’s also not the same market in each province.”

Legalize it — and tax it

Taxing cannabis is one of the major reasons for legalization. But other places that have legalized it haven’t seen huge increases in revenue — partly because of taxation structures, partly because of administrative costs, partly because there wasn’t a huge increase in the market after legalization.

“There is a lot of profit in legal cannabis,” says Clement. “But in the U.S. models, they’re not seeing a lot of that coming back to the state governments. They’re just covering their costs.”

Clement says weaker-than-expected revenues are consistent, despite differences in taxation in each jurisdiction. “There’s a lot of variation in where and how much they’re taxing in the production-to-sales chain,” she says. “Whether they’re taxing the producer, the distributor, or the consumer.”

While legalized cannabis promises to provide a lucrative market, it’s going to come with heavy administrative costs. “People don’t think about how much administrative effort has to go into this,” says Clement. “To do this properly, we need seed-to-sale tracking systems. Production facilities have to be inspected and held to standards. There have to be criminal checks for all their employees. There has to

be a licensing system to process and register who can produce and who can sell. None of that is cheap.”

On top of administration costs, Clement points to more burdens placed on health care and social services. “I hope we’ll see increased funding for support services for people who struggle with their substance use,” she says. “Also, public health promotions and materials, things like that. We need dedicated funding and resources.”

Challenges versus opportunities

While legalization is unlikely to happen without obstacles and roadblocks, it’s also going to provide a wide range of opportunities. Even if legalized cannabis is simply a break-even proposition for the government, the economic possibilities are tantalizing. Aside from the domestic retail market, there’s a burgeoning production industry that could create thousands of new jobs.

“Alberta is emerging as a global producer of cannabis,” says Clement. “We’re seeing big players moving in and large new facilities being built.” With new facilities come new employment opportunities. “Think of the range of skills such a facility would need. They need everyone from people who can set up tracking systems, IT, security, human resources managers and the horticulturists who actually care for the plants.”

Reducing the number of cannabis-related criminal records is another spinoff benefit of legalization with possible economic benefits, at least for individuals. “A criminal record limits your ability to live a full life,” says Clement. “You can’t travel, there are jobs you can’t have, you can’t volunteer with your kids because you were caught with a bit of pot when you were 19. There’s a feeling that that’s not the right punishment.”

When policy becomes law

Once policy recommendations have been tabled, lawmakers have to put them into practice with legislation. In a file as complicated and far-reaching as cannabis, there can be confusion over which level of government is responsible for what. Each level of government more or less has to wait for the one before in order to develop their own laws and regulations.

“There are very few legal issues where you have laws being passed at the federal, provincial and municipal levels,” says Lorian Hardcastle, an assistant professor in UCalgary’s [Faculty of Law](#) and a member of the O’Brien Institute for Public Health. “Now that the federal strategy is developed, each of the provinces roll out their own approaches, and then the municipalities respond with their own laws.”

The result is likely to be a patchwork of laws and bylaws across the country, with each jurisdiction having its own variations. While federal laws deal with criminal



The government doesn’t have a good handle on the cost of cannabis in the illegal market. It’s also not the same market in each province.

– Dr. Fiona Clement, PhD

offences and regulating production, provinces have jurisdiction over things like licensing retailers, age of consumption, and where and when cannabis can be sold. Municipalities deal with issues related to things like zoning and where cannabis can be consumed. Each jurisdiction also has the option to strengthen some of the previous level's laws, for example if a city tightens restrictions around provincial rules.

For Hardcastle, legal differences across provinces and municipalities represent an unprecedented opportunity for research. "Some provinces are regulating cannabis like alcohol in terms of where it can be consumed, while others are regulating it like tobacco," she says. "And we'll be able to compare them. For example, cannabis will be available much later at night in Alberta than in Ontario. In Alberta, privatized stores will be open until two a.m. Ontario will sell it in provincial stores the way they sell alcohol, so there won't be stores open until two a.m. Does this mean we'll see more impaired driving related to cannabis in Alberta? Maybe, maybe not."

Other areas of the law that will be affected by legalization include occupational health and safety,

landlord and tenant, and food safety laws. While the federal government has said it's holding off on regulating the production and sale of edible cannabis products, that will eventually add another layer of complexity. "With edibles you have not just a drug or a controlled substance, but then you also have the food side of things," says Hardcastle. "The government regulates food and drugs and edibles are both."

Hardcastle points to U.S. states that did not regulate edibles and says we can learn from those jurisdictions. "In the states that just let it happen, there was a lot of misinformation about edibles being reported," she says. "People were eating them and feeling nothing, because edibles take longer to kick in, so they would eat some more. And it would hit them all at once."

"You can't overdose on cannabis the same way you can on other drugs, but what if you think you're fine and you get in a car? What if you leave edible gummy bears out and little kids get into them? Those are issues with legal implications."

From a legal standpoint, legalization will provide a way to get information out and help the government get a better handle on what's really going on, so we can

Who is responsible for regulating what?



Federal government

- Criminal offences
- Advertising
- Medical cannabis
- Production

Provincial government

- Workplace safety
- Distribution
- Retail model

Municipal government

- Land use and zoning

- Possession
- Impaired driving
- Public health
- Taxation
- Age limits
- Home cultivation

- Public consumption
- Retail locations and rules

address health and public safety issues. “By legalizing instead of turning a blind eye, we can guard against problem areas,” says Hardcastle. “We can get better data and evidence. We can know what’s happening. Who’s consuming, how much they’re consuming, where they’re consuming. With seed-to-sale tracking, we also know who’s producing and where it’s going.”

Cannabis and campus life

At UCalgary, the notion of getting better data and evidence on cannabis is driving a campus-wide study that began this year. A cross-disciplinary group of researchers developed a survey, called UCalgary Campus Experience with Cannabis, which was sent to 4,000 students. The idea is to explore students’ experiences with cannabis, and to identify problem areas and gaps in services. A parallel study is planned in partnership with the University of Alberta, with

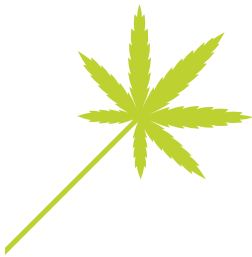
the idea being to merge the two data sets for a more complete picture.

After legalization, phase two of the project will follow up to see what’s changed, and phase three is to expand the survey to other universities across Canada. The intention is to provide a way for leaders and lawmakers to make informed decisions about policies and laws in the future.

“We want to measure pre-legalization and establish a baseline,” says Dr. Jacqueline Smith, PhD, an assistant professor in UCalgary’s Faculty of Nursing and the principal investigator on the study. “Canadian youth have the highest rates of cannabis use in the western world. We want to look at prevalence rates, predictors of use, protective factors, social stigma and service needs.”

“There’s a general sense that it’s a relatively harmless substance,” says Joel Mader, a research associate to Smith. “We want to understand how students perceive

Interprovincial variations



Variations on federal law

	BC	AB	SK	MB	ON	QC	NB	NS
Minimum age	19	18		19	19	19	19	19
Owning plants	4	4		0	4	0	4	4
Maximum possession	30 g	30 g		30 g	30 g	30 g	30 g	30 g

Variations on retail models

	BC	AB	SK	MB	ON	QC	NB	NS
Private retail (separate from alcohol) and government online sales		✓						
Private retail (separate from alcohol — except rural) and government online sales	✓							
Private retail and online sales			✓	✓				
Government retail (separate from alcohol) and online sales					✓	✓	✓	
Government liquor stores retail								✓

Variations on public consumption

	BC	AB	SK	MB	ON	QC	NB	NS
Restricted like alcohol					✓		✓	
Restricted like tobacco	✓	✓		✓		✓		

risk, if they think there are negatives associated with regular use, will they actually reach out to available support services, or are there any other methods we could offer if they start to experience problems.”

By surveying students before and after legalization, the researchers hope to be able to assess whether usage rates increase as cannabis use becomes more socially acceptable. “Research has shown that as perceived risk goes down, usage rates may go up,” says Smith. “We’re curious to see what happens here on campus.”

If legalization makes cannabis seem less risky, will it also make it more likely students will seek help when they feel they have a problem with it?

“Addictions and substance abuse are highly stigmatized compared to other mental health problems,” says Dr. Andrew Szeto, PhD, an assistant professor in UCalgary’s Department of Psychology and director of the Campus Mental Health Strategy. “There is very little research on the stigma related to cannabis.

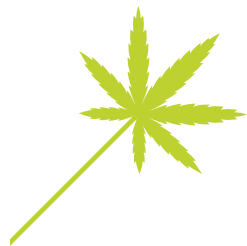
We want to assess the relationship between stigma and seeking help. We don’t have that data.”

Opening up about cannabis and risks

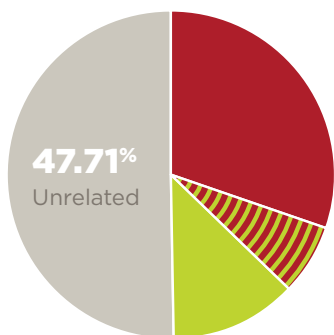
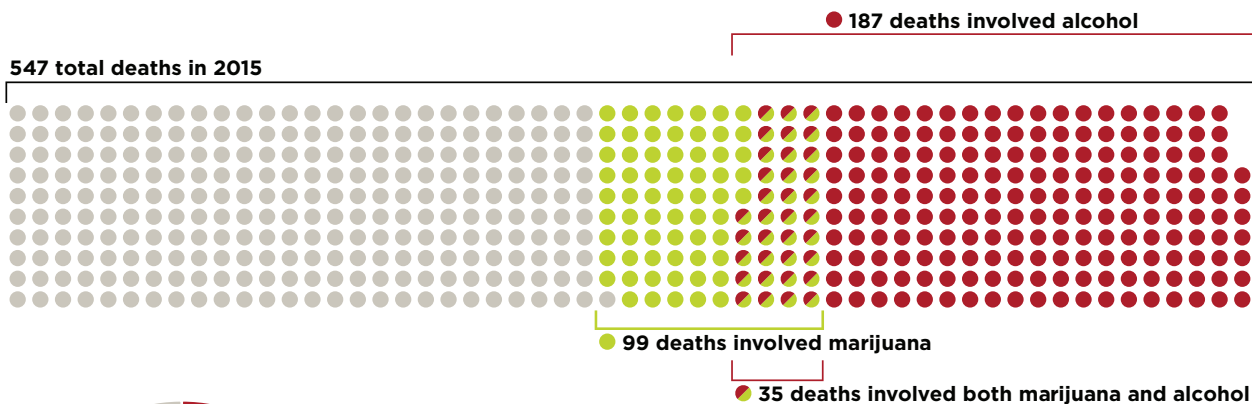
The criminalization of cannabis has made it difficult to study, in part because it’s hard to get funding and approval, and in part because people are less likely to be honest about their behaviour when it’s illegal. “There’s a lot of ethical red tape in order to explore an illicit substance,” says Smith. “And you get compromised disclosure. Until it’s actually legalized, I don’t think we’re going to get accurate information.”

If one of the reasons for legalization is to reduce the potential for harm to youth, then we need to understand how they’re using cannabis and their attitudes about it. “What’s really important is that we’re opening up the conversation,” says Smith. “We know Canadian youth

Traffic fatalities — a sample from Colorado



Of the 547 traffic fatalities in 2015 in the U.S. state of Colorado, 99 involved drivers who tested positive for marijuana and 187 who tested positive for alcohol. Of those, 35 involved drivers who tested positive for both.



34.18%
Alcohol involved



18.09%
Marijuana involved



6.39%
Convergence — alcohol and marijuana involved

Adapted from: Kayla Robertson, The Denver Post.
Source: National Highway Traffic Safety Administration.

are using it more than the rest of the world, so let's talk about that. Let's educate them about the risks."

With legalization on the horizon, Mader, Smith and Szeto expect students will be more forthcoming about their views and their habits, which will make it easier to determine what's actually happening and where the discrepancies are.

"We want to focus on general attitudes toward cannabis use and expectancies," says Mader. "If you think cannabis is going to have a positive effect, does that influence your choice to use it? We also want to look at impulsive decision making, gender, age, and other important factors that are predictors of use."

"We're taking a public health approach," says Szeto. "If we just say, 'no, no, no,' people are going to do it anyway. And then there's no way to control it or to reduce harms."

Because Canada is only the second country to legalize cannabis (after Uruguay), the study can help inform other jurisdictions that are considering legalization. "We're thinking about this as a national study," says Mader. "But it has international implications as well, for other countries to see what happened in Canada, what are some of the benefits of legalization, and what are some of the negatives you might want to consider ahead of time."

Change is possible

One of the examples Canada is setting for other jurisdictions is that massive social change is possible in a short period of time. "Unlike most files I've seen, this one is moving really fast," says Clement. "And we're going to be more or less ready for it. It shows that under the right conditions, with proper resources, a country can legislate policy change rapidly. This is one of those moments that defines Canada as forward-thinking leaders. I'm proud of the policies that have been tabled."

ABOUT OUR EXPERTS

Dr. Fiona Clement, PhD, is an assistant professor in the Cumming School of Medicine and the director of the Health Technology Assessment Unit in the O'Brien Institute for Public Health. Her research interests include drug and non-drug technology reimbursement and cost containment policy, and evidence in decision-making and health policy development.

Lorian Hardcastle is an assistant professor in UCalgary's Faculty of Law. She is also a member of the O'Brien Institute for Public Health and the Conjoint Health Research Ethics Board. Lorian's research interests focus on regulation and governance of the health care system, hospital and governmental liability and accountability, patient safety, health system organization and finance, comparative health policy, and the self-regulation of health professionals.

Dr. Jacqueline Smith, PhD, is an assistant professor in UCalgary's Faculty of Nursing. Her research interests include family, addiction and mental health, middle school drug and alcohol education, and post-secondary education programs and policies for safe alcohol and substance use.

Dr. Andrew Szeto, PhD, is an assistant professor in UCalgary's Department of Psychology and director of the Campus Mental Health Strategy. Beyond the implementation of the 28 recommendations of the Campus Mental Health Strategy, Andrew's research includes the use of social psychological approaches to the examination of mental illness stigma and the development and evaluation of stigma reduction and mental health programming in the workplaces, first responders, and in post-secondary institutions.



Why does pot make you so hungry?

How cannabis affects our bodies and brains

UCalgary researchers explore the biology behind cannabis, and how it acts upon various systems in our bodies.

By *Mike MacKinnon*

Dr. Keith Sharkey, PhD, loves food. This isn't unusual. But unlike most people, he can also tell you exactly what happens to your food before, during and after eating it — where your hunger impulses come from, how your body breaks down food, and how you get energy and nutrients from your food while it's in your gut. And he knows why cannabis makes you want more of it.

"I loved food so much that my first degree was in nutrition," says Sharkey, a professor in the Department of Physiology and Pharmacology in UCalgary's Cumming School of Medicine, and interim director of the Hotchkiss Brain Institute. "From there, I moved into gastrointestinal physiology and from there, into neuroscience. So I'm a hybrid researcher."

Sharkey's lab studies the nervous system in the gastrointestinal tract, and how the gut communicates with the brain to regulate things like energy levels and digestion. Part of that research involves understanding the endocannabinoid system. Endocannabinoids,

chemical compounds the body produces, play a role in everything from stress to pain to appetite to digestion.

In the gut, endocannabinoids regulate how quickly food moves through the intestines. They also help to digest food. And they help to protect our bodies from outside contaminants in our food, as well as from our own stomach acid, which is highly corrosive.

"The process of digestion and absorption of nutrients in the gut is quite complicated," says Sharkey. "It's a fantastic thing to think through and to study. We've been studying how the endocannabinoid system is involved."

The endocannabinoid system wasn't discovered until the 1990s, so how exactly it works isn't yet fully understood. "It wasn't really until the 2000s that major research was started," says Sharkey. "We still have a lot to learn, and we make major discoveries fairly regularly."

Sharkey says as more research is done, it's becoming clear how important the endocannabinoid system is to the way our bodies work. "We used to think the nervous

system and the immune system were the two big ones,” he says. “Now we know it’s involved in metabolism, in the heart, the skin, the liver. It’s remarkably widespread.”

Your brain (and body) on drugs

The endocannabinoid system works by releasing compounds that bind to cannabinoid receptors and activate processes in cells throughout the body. Each cannabinoid has a specific message for the cells to which it binds. If you think of a cell in the body like a room in a house, and a receptor like a lock with many combinations, then each cannabinoid has a different combination that allows you to do a different thing once you get into the room. Each cell can have dozens of different receptors.

The body produces cannabinoids on its own, but the cannabis plant also contains many different types of cannabinoids that bind to the receptors in our bodies. Tetrahydrocannabinol, or THC, is the main psychoactive ingredient in cannabis. It’s what gets you high.

Cannabidiol is another major cannabinoid. It’s non-psychoactive and is thought to have some medical benefits, like being a sleep aid and an anti-inflammatory.

When you take cannabis, it floods the cannabinoid receptors in your body and brain with THC and other cannabinoids. These have various effects depending on the dose, the potency and the person.

For example, in the case of what we call “the munchies” — the tendency of people who have taken cannabis to crave high-fat, high-carbohydrate snack foods — THC stimulates the appetite centres in the brain. We usually associate hunger with the gut, but Sharkey says the impulse is driven by the endocannabinoid system, which controls behavioural triggers in the brain related to eating.

“You eat because your body determines that your energy stores are reduced,” says Sharkey. “That’s called homeostatic feeding, or feeding that you need in order to maintain your typical lifestyle.” Our bodies measure our energy and fat levels carefully, and communicate to our brains when it’s time to replenish the supply.

“There’s another type of eating called hedonic or pleasurable eating,” says Sharkey. “When you see a buffet, for example. And you eat your normal meal, say one plateful of food. But there’s so much food, and you’re so excited by the way it looks and the way it tastes, that you eat two platefuls of food. That’s hedonic. You don’t need to eat that much, but you do.”

Cannabinoids work on both the homeostatic and the hedonic systems. “It makes food more rewarding to eat,” says Sharkey.

An anti-obesity drug?

You might expect a group of people who regularly eat large amounts of high-carb, high-fat foods to have

issues with weight. But, says Sharkey, paradoxically, population-level studies show regular users of cannabis tend to be thinner.

Sharkey’s lab investigated the phenomenon in a month-long study where mice were given THC. Some were fed a high-fat “Western” diet, and some were fed regular mouse food. To his surprise, not only did the mice who ate the high-fat diet lose weight, but their gut bacteria were altered.

“People who are obese have different gut bacteria than people who are lean,” says Sharkey. “We see the same in mice. We can reproduce this readily.

The surprising thing we discovered is that the animals who were treated with THC, who lost weight, ended up with normal, healthy gut bacteria. That was a big surprise. That’s the first time that’s ever been seen.”

Sharkey says that it would take human studies to confirm the findings, but he theorizes that THC somehow normalizes gut bacteria. How this happens is not yet understood. “Cannabis is not a weight-loss agent,” he says. “But what it does to metabolism is fascinating. It may explain why cannabis users are not as obese or why they’re thinner than the regular population.”

Barriers to research falling

Because cannabis is currently illegal, it’s difficult to study in controlled, scientific settings. “It’s hard to get funding, you won’t get government support, and it’s hard to access to the product,” says Dr. Matthew Hill, PhD, an associate professor in the departments of Cell Biology and Anatomy and Psychiatry in the Cumming School of Medicine, and a member of the Hotchkiss Brain Institute and the Mathison Centre for Mental Health Research & Education.

Hill, who researches the effects of stress on the endocannabinoid system, says the difficulty in conducting studies related to cannabis make the research scant and inconclusive. While small-scale studies have been done, Hill says it’s tough to draw conclusions on a larger scale. “It’s very hard to make causal assumptions unless we do controlled studies,” he says.

Hill says Canada’s upcoming legalization of cannabis will provide researchers with more opportunities to study the drug and its effects on the body. “This will make Canada an international leader in this field,” he says. “We’re the first country that’s going through legalization that has enough resources to promote research in this capacity. We are going to be the baseline that a lot of other countries use for their decisions.”



This will make Canada an international leader in this field.

– Dr. Matthew Hill, PhD

Cannabis and PTSD

As an example of an area that warrants further study, Hill says there's a relationship between cannabis use and post-traumatic stress disorder (PTSD), where THC appears to help PTSD sufferers sleep and helps them unlearn some of the triggers around their stress, something called "extinction learning."

"If you had a traumatic event in a forest, you may develop symptoms every time you see trees or that forest," says Hill. "That's a learned response. Extinction learning involves teaching you that situation doesn't necessarily mean danger. Endocannabinoids seem to help that kind of learning. And when you do exposure training with THC, that learning seems to be improved."

As far as cannabis as a sleep aid goes, Hill points to studies done by the Canadian military, where war veterans were given THC pills before bed and asked to report on their symptoms. The findings show THC helps veterans sleep and makes their nightmares less troubling. "People with PTSD often have violent nightmares," says Hill. "There's a lot of re-experiencing of trauma during sleep, which exacerbates the symptoms. There is some emerging evidence that THC makes them sleep better and not have these nightmares, or at least not remember them."

While Hill doesn't directly research cannabis, his work shines a light on the biology behind its effects. "When someone uses cannabis, they flood their brain and body with THC, which activates cannabinoid receptors everywhere," he says. "Most people feel a reduction of stress and anxiety, and relaxation. The work we do helps us understand why cannabis modulates emotional behaviour and stress responses, and the potential of cannabinoids as therapeutic options for things like PTSD and social anxiety."

Not your grandparents' cannabis

Cannabis has changed drastically over the past decades, making what little research has been done even less valuable, says Sharkey. "The cannabis of today is ten times stronger than it was in the hippie era," he says. "So the old literature is really worthless because people are just not consuming that type of cannabis anymore. We need to do a lot of research to really understand what these newer products are doing."

Medicinal cannabis has been legal in Canada since 2001, taken to treat a wide variety of conditions. But the same restrictions have prevented much research from being done on how effective it actually is. "I would say medicinal cannabis is just as poorly understood as recreational cannabis," says Sharkey. "There's no question cannabis is a painkiller. Possibly it's an anti-inflammatory. There was a recent study showing that cannabidiol may have some benefits in epilepsy. There's a whole range of other things it may do. I say 'may' cautiously, because the literature just isn't that compelling."

In spite of his scientist's caution, Sharkey isn't ready to discount centuries of traditional belief in cannabis as a medicinal herb, and says he thinks further research is likely to bear out some of what medical cannabis users already know intuitively. "Enough people have talked about its benefits for long enough, and in enough different contexts, to believe there's something there," he says.

"I don't think it's a purely psychological construct where people tell themselves they feel better just because they use it."



Learning from other jurisdictions

Both Hill and Sharkey say other jurisdictions that have legalized cannabis can teach us about what we can expect in the coming years. “You can look at Colorado and Washington as small-scale pilot studies,” says Hill. “One of the short-term negative effects we saw was an uptick in acute ER visits where people have consumed too much, either through eating it or not knowing its potency, and have a panic attack or an adverse biological response. But I view that as a lack of proper educational campaigns.”

A rise in hospital emergency visits is more than offset by a drop in drunk driving fatalities, as well as fewer opioid overdoses and deaths. This suggests users are taking cannabis instead of other substances. “Opioids are a huge public health problem in North America,” says Hill. “So any benefit that comes from that, I would view as a positive.”

“There’s an enormous overuse of narcotics,” says Sharkey. “People take a lot of painkillers, which leads to many problems, including addiction. Cannabis is also addictive, but it’s far less addictive than opioids, and the harms we see because of cannabis rarely, if ever, include death.”

The last substance-related social shift on this scale was the repeal of alcohol prohibition. In the decades since then, research has made it possible for us to gain a much better understanding of alcohol and its effects. Hill hopes with legalization of cannabis, we’ll eventually have the same level of knowledge.

“We’ve learned a lot about the effects of alcohol on the brain, and risks associated with addiction, because of the fact we can study alcohol,” says Hill. “That has helped us make very strong educational platforms about safe alcohol use, and understanding limitations. We don’t have a baseline like that for cannabis.

“From a scientist’s perspective, the most exciting part of this is the fact that the doors are going to open and allow us to study it properly.”

ABOUT OUR EXPERTS

Dr. Keith Sharkey, PhD, is a professor in the Department of Physiology and Pharmacology in UCalgary’s Cumming School of Medicine, and interim director of the Hotchkiss Brain Institute. Keith’s research focuses on the role of nerves in the gastrointestinal (GI) tract, and brain-gut communication in relation to studies of energy balance and the control of GI functions.

Dr. Matthew Hill, PhD, is an associate professor in the Departments of Cell Biology and Anatomy and Psychiatry in the Cumming School of Medicine and a member of the Hotchkiss Brain Institute and the Mathison Centre for Mental Health Research & Education. Matt’s research seeks to understand the mechanisms by which exposure to stress causes changes in neural functioning and behaviour, with a particular emphasis on anxiety.



Is driving high as bad as driving drunk?

Legalization and what it means for traffic safety

UCalgary researchers study how legalized cannabis could affect our roads and highways, including driving habits with cannabis, impaired driving laws, and a roadside sensor to detect cannabis.

By Mike MacKinnon

Researchers often seek to make sense of the unknown, to explain the unexplainable, to bridge chasms in our understanding of the universe. But it can be just as important to challenge and validate what we think we already know.

“It’s surprising how much research you have to do to prove the obvious,” says Dr. Jeff Caird, PhD, a professor in the Department of Psychology in UCalgary’s Faculty of Arts.

In this case, “the obvious” is that driving while impaired by cannabis is a bad idea.

Legalization of cannabis in Canada is expected this year. Part of the proposed legislation deals with driving

while impaired by cannabis. “It’s very clear that the use of cannabis before driving is an issue,” says Caird, whose labs focus on reducing the number of injuries and deaths in transportation and health care. “The issue has been somewhat explored by Health Canada and Transport Canada leading up to legalization, but there are still a lot of things we don’t know.”

Part of the difficulty with cannabis and impaired driving is that so few studies have been done to date. “It’s hard to get access to cannabis for scientific use,” says Sarah Simmons, a PhD student supervised by Caird in his Cognitive Ergonomics Research Laboratory. “So the level of research activity has been sporadic.”



Some people — especially young males — think their driving is safer when under the influence of cannabis.

— Dr. Jeff Caird, PhD

Simmons is working on a meta-analysis, compiling the statistical results of experimental studies in order to summarize the available evidence. In the studies she's looking at, conducted in driving simulators or on the

road, scientists tested drivers who had taken cannabis and those who hadn't and compared the results. They measured things like hazard detection and response, vehicular control, lane keeping, and ability to maintain speed and headway.

One of Simmons' preliminary insights is that unlike with alcohol-impaired drivers, drivers impaired by cannabis seem to have an awareness that their driving is affected. "Some

studies show that they slow down and they increase their headway in an attempt to compensate," she says. "Whereas with alcohol, people underestimate their own impairment."

However, Caird says some people — especially young males — think their driving is safer when under the influence of cannabis. In response, he's planning a study to determine why that belief is so persistent and how to counteract it. "Because they think they're better drivers, they drive," he says. "Why don't they understand that it's impairing? How do we change their intentions to drive?"

While the risks associated with drivers who are impaired by alcohol and those impaired by cannabis are different, both are still much more likely to be involved in a crash than sober drivers. "Alcohol makes people much slower to respond to their surroundings, such as when pedestrians walk into the street or cars pull out," says Caird. "With cannabis, they're also slower. That's one of the main reasons why both groups crash — they don't respond fast enough to immediate threats."

Opportunities for more research

If experiences in other jurisdictions are any indication, legalizing cannabis will make it easier for researchers to study its effects and to determine what changes, if any, legalized cannabis is causing.

"One unintended consequence is that if people consume cannabis, they're less likely to consume alcohol," says Caird. "One of the declines you see in Colorado after legalization is in the consumption of beer. Maybe that means people are less likely to drink and drive, which is the number one killer of people on the road. The more you drink, the higher the risk of a crash. We don't have the numbers to support this yet, but anything that reduces drinking and driving is going to reduce fatalities."

With her meta-analysis, Simmons also intends to figure out where the gaps are in the existing research. "There's going to be much more research on cannabis and driving in the future," she says. "One of my goals is to identify limitations and problems, so scientists have something to refer to. What they should be looking for, what biases they should avoid, how many participants to recruit, and so on. We need better research going forward."

Testing for THC

Like with alcohol, the proposed legislation for impaired driving with cannabis includes a limit on how much THC (tetrahydrocannabinol, the main psychoactive ingredient in cannabis) can be in your blood before you get charged with impaired driving. Presently, the limit is five nanograms per millilitre of blood.

The issues with such a limit are that there is currently no device like a breathalyzer that police can use to screen for impairment during roadside stops, and there's debate over whether or not five nanograms of THC per millilitre is an accurate indicator of impairment.

While alcohol diffuses throughout your blood and bodily tissues fairly equally and predictably, THC does not. Everyone responds differently to THC and unlike alcohol, there are vast differences in types, strains and sources of cannabis — and in its THC content. THC is also fat-soluble, meaning your body stores it in its fat cells, where it can be released days or weeks later. The metabolized THC is still detectable by blood tests, even though it's no longer psychoactive.

"We've been living with alcohol for a very long time as a society," says Lisa Silver, a former criminal lawyer and an instructor in UCalgary's Faculty of Law. "And most of us can kind of self-regulate. We kind of know what 0.08 blood alcohol content feels like. And we can calculate the elimination rate based on our weight and the amount of alcohol consumed. But what's the elimination rate for THC? The evidence says it can stay in your blood for days."

"Is the cannabis we're buying going to be properly labeled with THC content?" asks Silver. "How am I going to know how strong it is? It's easy to say 'don't smoke and drive,' but for how long? If I have a glass of wine on Monday, I wouldn't assume that I shouldn't be driving on Wednesday."

Silver says elimination rates will be even more controversial with proposed changes to impaired driving laws. New legislation will make it illegal to be impaired not just while driving, but within two hours of driving.

Currently, prosecutors must prove you were impaired while you were operating a motor vehicle, which they can do with alcohol by using the standard elimination rate to calculate backwards from the time you gave a blood sample to the time you were

suspected of driving while impaired. But since THC affects people differently than alcohol, extrapolating time of impairment backward is much more difficult.

“The way the act reads now, it says ‘everyone commits an offence who operates a motor vehicle while the person’s ability to operate the vehicle is impaired,’” says Silver. “According to the new act, it will be, ‘everyone commits an offence who is impaired within two hours after ceasing to operate a motor vehicle.’”

In theory, police could show up at your door up to two hours after you stopped driving and, if they find you impaired, charge you with a crime. Silver says the new provisions are intended to eliminate so-called “bolus consumption,” where people who are pulled over consume alcohol in front of police in order to skew test results and be able to claim they weren’t intoxicated while driving.

Part of the rationale for legalization is to ease the burden on the court system and to stop saddling people



The problem is that THC isn’t volatile, so it isn’t in your breath, You have to find it in bodily fluids.

– Dr. Viola Birss, PhD

with criminal records for what are perceived to be minor infractions. But Silver predicts the new legislation will continue to clog up the courts and result in criminal charges, but for different reasons. “Our laws need not be overbroad, and this is overbroad,” she says. “We need our laws to fit the circumstances properly.”

Moving past judgement calls with chemistry

Whether or not the five-nanogram-per-millilitre limit for THC content in the blood is an accurate measurement of impairment, another problem is that police have no reliable way to screen for THC during roadside stops. They rely on a combination of intuition and so-called drug recognition experts to determine whether someone they pull over is impaired and should undergo a blood test.

“There are ways of measuring THC in blood and saliva, but none of them are portable or could be used for roadside tests,” says Dr. Justin MacCallum, PhD, an assistant professor in the Department of Chemistry in UCalgary’s Faculty of Science. “You take a sample and send it off to a lab, and two weeks later you get results. We’re more interested in a screening tool like a breathalyzer. Something police can use to say, ‘okay, this is someone we need to take down to the station.’”

To address the issue, MacCallum and Dr. Viola Birss, PhD, a professor in the Department of Chemistry, are working together to develop a small, simple device police can use to detect the presence of THC in someone’s saliva. “The problem is that THC isn’t volatile, so it isn’t in your breath,” says Birss. “You have to find it in bodily fluids.” Having the police take blood samples roadside is obviously not feasible and could get into rights violations, so saliva is the next best thing.

But it’s not as easy as it sounds. Of the hundreds of cannabinoids that show up in blood and saliva tests, only a few of them, like THC, are psychoactive. The rest, like cannabidiol, which is the medicinal compound in medical marijuana, don’t cause you to be impaired. Also, for chronic users, once the body metabolizes THC, it’s no longer psychoactive but can still be detectable for weeks.

“All of these compounds are fat-soluble, so they end up in your fatty tissue and get slowly secreted out of your body,” says MacCallum. “So imagine someone is a chronic marijuana user who stops cold turkey, and two weeks later they go for a jog and release a bunch of these fatty molecules into their bloodstream. They would test positive on a crude screening test, but that doesn’t mean they’re impaired.”

A further wrinkle is that any roadside sensor would have to be extremely sensitive to detect five nanograms of anything. To put it in perspective, five nanograms amounts to about one ten-thousandth of a grain of salt.

A two-pronged attack

In order to solve their two main challenges — how to separate psychoactive cannabinoids from non-psychoactive ones, and then how to count them — Birss and MacCallum are relying on biomolecular engineering and electrochemistry.

“My lab is taking a protein that binds naturally to THC and some of these other compounds, and engineering it to make it more specific to the things we care about,” says MacCallum. “We can use this protein to fish out the molecules that make people high, and then use electrochemistry to measure them.”

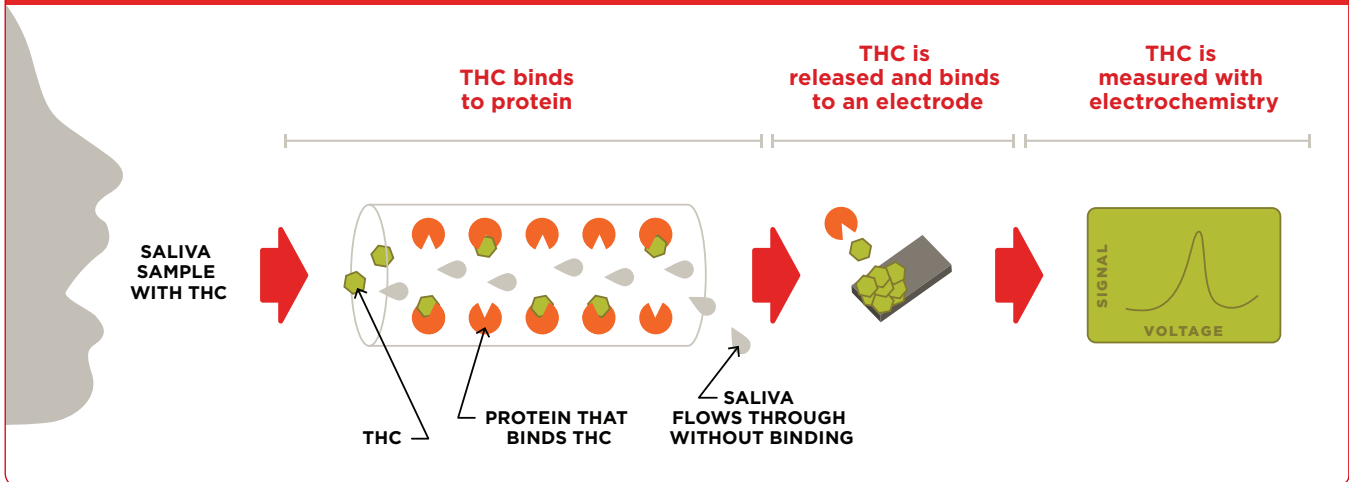
“THC can be oxidized to create an electrical current,” says Birss. “The more THC present in the sample, the bigger the current.”

The protein that binds to THC in the body is called Fatty Acid Binding Protein (FABP). Its job is to shuttle certain molecules around your brain. One is an endocannabinoid — a cannabinoid your body produces on its own — called anandamide. THC binds to the same molecule. In theory, the FABP could be used to separate psychoactive cannabinoids from benign ones.

The challenge is that the difference in the molecular structures of those cannabinoids is minute — often simply a matter of one or two more atoms of oxygen.

Impairment testing

Proposed limit is **five nanograms of THC** (tetrahydrocannabinol, the main psychoactive ingredient in cannabis) per millilitre of blood



“Here you have this molecule, and the only thing that’s different from the next molecule is this one tiny little part over here,” says MacCallum. “You have to design the protein so that the molecule you’re interested in fits, and the other ones don’t.”

Detecting other drugs

Looking beyond cannabis, MacCallum and Birss imagine being able to detect the presence of virtually any drug during a roadside stop. “There are perhaps way more impaired drivers than we would like to contemplate out there,” says MacCallum. “There’s a whole spectrum of other things that need to be detected.”

“People are taking all kinds of drugs and medications that impair their ability to react quickly,” says Birss. “There’s a bigger problem than we all realize. That’s the next horizon.”

Jeff Caird has what may seem like an obvious solution. “For people who choose to use cannabis and consider driving — don’t.”

ABOUT OUR EXPERTS

Dr. Jeff Caird, PhD, is a professor in the Department of Psychology in UCalgary’s Faculty of Arts. His research focuses on human factors in health and transportation, aging, patient safety and traffic safety.

Sarah Simmons is a PhD candidate who works with Jeff Caird in the Cognitive Ergonomics Research Laboratory. Her research interest are human factors in health and transportation and traffic safety.

Lisa Silver is a former criminal lawyer and an instructor in UCalgary’s Faculty of Law. As a research lawyer, Lisa has written numerous facta and opinion briefs for matters before all levels of the Alberta courts, including SCC leave applications.

Dr. Justin MacCallum, PhD, is an assistant professor in the Department of Chemistry in UCalgary’s Faculty of Science. His lab studies protein structure and biomolecular recognition using a combination of computational modeling and biophysical experiments.

Dr. Viola Birss, PhD, is a professor in the Department of Chemistry in the Faculty of Science. Viola is a world leader in the area of electrochemistry at surfaces and interfaces and in nanomaterials development for a wide range of clean energy applications.



Green rush: Exploring the business of cannabis

Like the time when Prohibition was repealed, legalization of cannabis means a brand-new (formerly illegal) sector is about to be born. UCalgary researchers look at what shape such a newly legitimate industry might take.

By Jennifer Allford

An IPO market cap estimated at 1.5 billion. Stock jumps for coffee shops converting to cannabis lounges. A rock band partners with a producer. The business pages are full of news about cannabis as we get closer to October 17, 2018 — the day recreational cannabis becomes legal in Canada and instantly creates a new industry with a long history.

Cannabis has been bought and sold for thousands of years. In Canada, it was declared illegal in 1923, a year after Alberta activist Emily Murphy published a book suggesting marijuana could turn people into homicidal maniacs. Decades later, in 2000, Ottawa legalized growing cannabis for personal medicinal purposes. A few years later, the regulations shifted and only licensed producers were allowed to grow medical marijuana.

This fall, the rules of the game are changing again and thousands of entrepreneurs are getting ready to play. Some analysts suggest legal cannabis in Canada could be a \$20-billion industry. That's more than double the \$9.2 billion Canadians spent on beer in 2017 and almost triple the \$7 billion spent on wine across the country. Hundreds of companies have applied to the federal government for licences to grow or sell cannabis. And many more investors are putting their money down.

"You see most of the money going into the growing operations," says Dr. Alice de Koning, PhD, a senior instructor for entrepreneurship and strategy at UCalgary's Haskayne School of Business. "There's massive expansion, particularly here in Alberta, and incredible investment in large-scale growing operations."

And the medical marijuana companies, the ones that have been growing for the medical market, are very well-positioned to expand to recreational use.”

As the countdown to October continues, colourful “Coming Soon” signs are going up in more and more store windows across the country. But there’s no certainty all these cannabis outlets will survive the initial frenzy. “Like in everything in private enterprise and the free market, some will succeed and some will fail and that’s just the way it always goes,” says UCalgary alumnus Todd Hirsch (MA ’93), the chief economist at ATB Financial. “My guess is five years from now we will not see hundreds of successful retail cannabis operations.”

As bureaucrats at all three levels of government finish writing pages and pages of regulations about the production, sale and consumption of cannabis, entrepreneurs with skin in the game are anxiously awaiting ‘go time.’ “Honestly it’s all a best guess right now,” says alumnus Khalid Abdul Razak (BA ’09), a former management consultant and current founder of coffeeshop, a store gearing up to sell high-end, stylish cannabis accessories. “There’s no 100 per cent proof of anything because October 17 is day one and October 17 is when we’re going to see peoples’ business strategies and whether they pan out or not.”

An industry taking shape

When cannabis businesses throw their doors open this fall, there’s little doubt they will have customers waiting. Unlike blockchain, smartphones, or other products that burst into the marketplace out of nowhere, cannabis has an existing customer base — millions of people who already use the product (legally for medicinal purposes, or otherwise).

“We do have a high percentage of adults using so there’s no risk there,” says de Koning. “But if you look at the number of growing operations that are planned and the investments that are in place it just seems like there is way more supply than Canada could ever absorb.”

Many entrepreneurs, however, are already thinking well beyond our borders to selling their goods and services into other jurisdictions that have or are poised to legalize marijuana. “Canada is, as we all know, the first G7 country to legalize it for adult use,” says Abdul Razak. “So we are ushering in a new era to the world. We wanted to be part of this story. It’s a huge opportunity.”

Before they take on the world, cannabis companies like Abdul Razak’s have to make it here at home and survive the churn that happens in every new industry. “What you see in the early stages of an industry is a lot of small companies are working on their own solutions,” says de Koning. “At a certain point it becomes clear which solutions are going to gain traction in the market.

I’m not even going to say which solutions are best, just which solutions gain traction.”

At that stage, the companies have two options: either adapt to the emerging standard or quit. “A new industry starts out like a big mess, with tons of companies entering and exiting,” she says. That mess will eventually sort itself out into a cannabis value chain, with different players offering products and services at different stages.

“What I’m looking for is the emergence of the niche products, organic or strains that are a little bit unusual,” says de Koning. “You see that in the beer market and the wine market here in Canada.” Some alcohol and pharmaceutical companies as well as some (soon to be formerly) illegal cannabis producers are joining the fray and getting ready to enter the cannabis market.

“We just don’t know what it’s going to look like yet,” says Hirsch. “Will it look like a duopoly where you have two major companies that dominate the market, like a Coke and Pepsi, or will you have an oligopoly like retail grocery stores where you have somewhere between six and ten major players in the market?”

Ancillary opportunities

The cannabis industry offers opportunities for businesses well beyond marijuana itself. Just ask Taco Bell. The company is one of many fast food outlets seeing huge growth of late night sales in Colorado, where cannabis is already legal for recreational use. The CEO has even joked on Reddit that Taco Bell sales are up “420 per cent” (referring to 4/20, the international day to celebrate all things marijuana).

From munchies and bongs to lawyers and retail security systems, a legal cannabis market creates a number of ancillary business opportunities. Abdul Razak’s company, coffeeshop, plans to ride the initial “post-prohibition” industry churn by selling beautiful pipes, storage containers and other accessories for cannabis. “We’re aiming at the sophisticated cannabis consumer who values elevated design, meticulous craftsmanship and thoughtful functionality,” he says. “Our focus is going to be curating these products and accessories and hopefully moving into the design and creation of it as well by working with industry partners.”

Down the line, coffeeshop (named for the establishments for consuming cannabis in the Netherlands) may get into the growing business with strategic partners. But for now, the company is focusing on curating accessories and lifestyle products as well as potentially opening a flagship store in a year or so. “Just because it’s a new industry doesn’t mean we can’t adopt best practices from other industries,” says Abdul Razak. “You can adopt strategies from the world of consumer products, alcohol, and tobacco. We can learn a lot of things from those industries.”

Beyond the hype, excitement and dollar signs in investors' eyes, good old-fashioned business strategy and principles will determine who succeeds, and who doesn't. "Cannabis is like anything, we shouldn't be looking at it like a gold mine," says Abdul Razak. "People who get into this with the right strategy and the right operating model are going to win at the end of the day. It happened in the dot-com era, it happened in cable TV, it happened with cryptocurrencies and it's going to happen here as well."

As entrepreneurs across Canada get ready to launch their ventures this fall, de Koning and colleagues at the Haskayne School of Business are planning research into the emerging industry — some with the goal of starting a business and others to better understand industry dynamics, the emergence of new business concepts and dealing with uncertain regulatory and cultural change. "There are some specific questions," says de Koning. "Is there a contrast between the medical and recreational sides of the industry and will the distinction between value chains persist as legalization becomes more 'normal?'" Researchers are also interested in studying how large growing operations and small coffee shops will co-exist and how the market evolves.

But one thing is certain now — not every operation will succeed. "Some of the enthusiastic people who are getting in just aren't skilled enough as business people," says de Koning. "They love cannabis, they love the culture and everything around it but that doesn't necessarily mean they can run a business successfully."

At some point, the smoke will clear and all the speculation about the brand-new industry will turn into a list of winners and losers — and with them a long list of lessons for the next generation of entrepreneurs entering a new sector. "I can't think of another example where there has been this kind of sudden change in the legislation that will create this new legitimate industry," says Hirsch. "It will probably surprise people what it ends up looking like. It's a once-in-a-lifetime opportunity to watch something like this unfold."

ABOUT OUR EXPERTS

Dr. Alice de Koning, PhD, is a senior instructor for entrepreneurship and strategy and Area Chair for Entrepreneurship and Innovation at UCalgary's Haskayne School of Business. Her research considers how social and institutional contexts affect entrepreneurial cognition and opportunity recognition. Alice's current projects include metaphors for entrepreneurship in public discourse, how Champagne World Fairs created entrepreneurial-driven growth in 12th century Europe, how governance structures can impact employee-driven innovations, and the impact of experiential learning methodologies.



Avoiding and overcoming addiction: The cautionary side of cannabis legalization

As Canada prepares to legalize cannabis, UCalgary researchers look at ways to overcome problem use and ways to avoid it in the first place.

By Mike MacKinnon

People around the world use cannabis for a wide range of reasons, including religious, cultural — and simply recreational. For thousands of years, cannabis has been a powerful weapon in the arsenal humans have developed for celebrating and for taking the edge off.

“We all need distractions and pleasures,” says Dr. Chris Wilkes, MD, a professor in the Cumming School of Medicine’s Department of Psychiatry and section chief for child and adolescent community and specialized services. “Whether we’re tired, or upset, or celebrating something, most of us have used some kind of substance. Alternatively, we may engage in other activities such as eating food, shopping, exercise, sex,

gambling, whatever. These are some of the common ways we cope with life’s stresses and have fun.”

While turning to physical or material distractions to blow off steam is perfectly normal, some people’s use eventually becomes problematic and drifts into the arena of addiction, or what’s nowadays called “use disorder.” Use disorder is defined as impairment of control over your use, meaning you regularly use more than you intend to, or more often than you intend to. This is the compulsive craving for an activity or substance, with continued use despite negative outcomes. In other words, you keep using even when you know it’s causing problems in other areas of your life, like your relationships, your job or your health.

As Canada prepares to legalize cannabis, Wilkes is concerned that people who are more likely to develop use disorders or experience negative medical consequences will have easier access to the drug, and don't fully understand its risks. "Because it's a natural product, people will think it's safe," he says. "They're often misinformed about the dangers for children, adolescents, pregnant women and people with mental illnesses."

Wilkes is also worried that there won't be enough medical and mental health support services available to people who develop problems with its use. "The available treatment resources, messaging and education haven't kept up with the intention of legalization," says the member of the Hotchkiss Brain Institute's (HBI) Mathison Centre for Mental Health Research & Education. "Addictions are common, but we haven't actually put more money into treatment services."

Mental health and addiction

Wilkes, a clinician, treats at-risk children and youth who have been involved with Children's Services and have

been referred to him through family courts. Many have mental health issues, and many are already using cannabis and other, more serious drugs such as opioids or crystal meth. According to Wilkes, people with pre-existing mental health conditions are more likely to experience adverse effects due to cannabis use, and more likely to develop use disorders.

"We know some people are more vulnerable," says Wilkes. "If you have a family history of mental illness, or come from a background of adverse childhood events, you've come through a period of toxic stress and you have a stressed brain. In mental health, the biggest trigger for people to use substances is because they're anxious or unhappy, or they're feeling depressed. And when people are suffering or in distress, they look for relief. If you take something that gives you a pleasant feeling, then you want to do that more often."

Wilkes says that once people are in that cycle of dependence, it can perpetuate itself. "What happens is you progress to what we call a salience disorder," he says. "You go looking for that, and your other rewards — being with people or doing other activities — become less relevant. That's the addiction pattern."

Another cause for concern is that because cannabis is often marketed as a safer, more natural alternative to pharmaceuticals, some people with mental illnesses will stop taking their prescription medication and use

cannabis. "We see people who stop their antipsychotic medication and anti-depressants and use cannabis instead," says Wilkes. "They think it's a natural product, so it's good for them, and they end up in the hospital."

Number one addictive substance

While cannabis is generally thought to be less addictive and less harmful than other substances, it's still the number one illicit substance for which Canadians seek treatment, according to Dr. David Hodgins, PhD, a professor in UCalgary's Department of Psychology and a member of the HBI.

Hodgins says that while the percentage of cannabis users who develop problems is lower than with other illegal drugs, the sheer number of cannabis users means more people on the whole get into use disorders. "Most people who use cannabis don't get into difficulties with it," says Hodgins. "And the health consequences aren't as dramatic as with other illicit drugs, or even licit drugs like alcohol. But even though fewer people proportionally get into problems, the gross number is larger."

Because the health consequences of other drugs are more severe, Hodgins says cannabis use disorder doesn't get as much attention. But with legalization, Hodgins predicts an increase in use, which will lead to an increase in problem use. "More people are going to experience negative impacts," says Hodgins. "How we handle that is an important issue."

Steps to self-recovery

In addition to increasing funding and resources for people who seek treatment for cannabis use disorder, Hodgins says it's important to develop supports to help people overcome problem use on their own. Seeking treatment isn't feasible for everyone because of cost, practicality and stigma. But Hodgins' research into addiction recovery has shown that many people are able to overcome use disorders naturally, without treatment.

"There are multiple pathways to recovery," says Hodgins. "Treatment is an essential part of our care system, but we should also expand the system to promote self-recovery."

In order to help people recover from use disorders on their own, Hodgins' research also looks at common elements of addictions and common steps to recovery. "We're looking at commonalities between different addictions," says Hodgins. "Right now, substance addictions and behavioural addictions — things like gambling addiction, video game addiction, pornography addiction — all tend to be treated differently. But the underpinnings are similar. Our goal is to develop what we call a trans-diagnostic clinical approach that focuses on helping to improve the underlying factors."



The health consequences aren't as dramatic as with other illicit drugs, or even licit drugs like alcohol.

— Dr. David Hodgins, PhD

STRATEGIES FOR SELF-RECOVERY

Many people have overcome cannabis use disorder on their own, without treatment. Here are some of the strategies these “winners” use to quit or cut back on cannabis use. These strategies can also be used to help overcome problems with other substances or behaviour.



Find your Motivation

Asking yourself why you would want to cut back or quit can increase your motivation to tackle the difficult task of changing your behaviour. How would life be different if you used less or not at all? What are the immediate and longer-term benefits of less use?



Active Reminders

If you continue to use heavily, reminding yourself of the past or possible future negative consequences of your use is helpful in keeping your motivation high.



Focus on other Activities

Have many of your activities become associated with drug use? What activities can you start or re-start that do not involve drug use? These activities not only fill time, but also distract from thoughts about cannabis use.



Avoid Cues to Use

Drug use quickly becomes associated with environmental cues that can then cause urges and cravings. These cues can be internal (e.g., having certain emotions such as boredom, sadness or excitement, or feeling certain physical sensations such as pain or hunger) or external (e.g., places you use, drinking alcohol, listening to certain music).



Spend time with Non-Users

These can be people who actively support your decision to change, or people for whom cannabis use is not part of their regular routine.

Hodgins says people who manage to recover from use disorders on their own do so with methods similar to what people learn in treatment. “It’s things like making a commitment to staying away from cues for using,” he says. “Getting involved in other activities is another important strategy in recovery. Some people outside of treatment naturally figure out how to do that.”

Learning how people who recover naturally do so is an important step in helping others do the same. “We’re looking at how to promote that,” says Hodgins. “We know some people don’t want to go to treatment so can we provide them with web-based support or other supports? How can we move them in the right direction in a faster and more efficient way?”

Cannabis learning curve

While neither Hodgins nor Wilkes expect legalization to go perfectly smoothly, both also acknowledge that a harm-reduction approach is likely to be more successful than criminalization.

“We shouldn’t have a repressive approach to the use of drugs,” says Wilkes. “We need to be much more open, generally. But we need to regulate, and we need to inform, and we need to have supports and treatment services available.”

Hodgins points to other substances and activities that were once illegal, specifically alcohol and gambling.

“We’ve chosen to make alcohol and gambling available, and to encourage people to use them safely,” he says. “On balance, we seem to be comfortable with that. I think we’ll get to the same comfort level with cannabis. People are doing it anyway, so let’s put some rules around it.”

ABOUT OUR EXPERTS

Dr. Chris Wilkes, MD, is a professor in the Cumming School of Medicine’s (CSM) Department of Psychiatry and section chief for child and adolescent community and specialized services. He is a member of CSM’s Mathison Centre for Mental Health Research & Education at the Hotchkiss Brain Institute.

Dr. David Hodgins, PhD, is a professor in UCalgary’s Faculty of Arts. His research interests lie in the area of addictive behaviours, including alcohol and gambling addictions, and comorbid psychiatric disorders.

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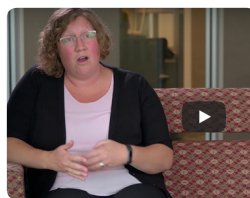


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