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VIEWPOINTS

Health Perspectives on the Legalization of Cannabis

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In recent years, the intricate issue of legalization and decriminalization of cannabis in Canada has engendered significant political and media scrutiny. In essence, decriminalization of cannabis would allow personal use of the substance without it being classified as a criminal offense, but — depending on the circumstance — it may still incur a legal fine. As is the case with alcohol and tobacco, legalization of cannabis would be regulated tightly.¹ The past two decades of public opinion polls have unfolded a narrative that indicates increasing support for either decriminalization or legalization of cannabis.^{1,2} For instance, a public opinion poll featuring a randomized sample of 1473 Canadian voters determined that 53% favoured the legalization of cannabis. Comparatively, 34% of Canadians from this poll disagreed with legalization. When voters within this sample were asked how the government should handle cannabis, 68% of Canadians were in favour of reappraising cannabis legislation, of which 35% argued for legalizing with taxation while 33% supported decriminalizing possession of small amounts.³

Proponents of legalization argue that the influx of available cannabis could prevent opioid-related overdoses through the substitution effect, a behavioural economics theory postulating how the availability of one good can influence the use of other goods.^{4,5} For most of the present century, prescription opioid-related misuse has presented a unique public health epidemic in Canada, resulting in an alarming rise in morbidity and mortality. The province of Ontario has responded by removing OxyContin from its public health drug benefit formulary, yet a decrease in its availability has led prescription opioid users to begin using fentanyl as a substitute opioid. Subsequently, Canada is now one of the largest consumers of fentanyl in the world.⁶ It is argued that the prescribing behaviour of physicians has been the driver of the opioid epidemic.⁷ This suggests that physicians may need to be open to prescribing alternative antinociceptive treatments.

The activation of cannabinoid receptors in the central and peripheral nervous systems has demonstrated antinociceptive properties.⁸ A study published in *Neuropsychopharmacology* suggests that medicinal cannabis provides effective pain relief in patients with HIV-associated intractable pain.⁹ In another recent study examining cannabis as a substitute for opioids, 97% of patients in the sample “strongly agreed” that they were able to effectively decrease the amount of opiates

they consumed when on cannabis.¹⁰ Furthermore, 81% “strongly agreed” that consuming cannabis alone was more effective at treating their condition than jointly using cannabis with opioids.¹⁰ Research on medicinal cannabis in Arizona — a state that legalized cannabis in 2010 — indicated that 75% of opioid-dependent users had experienced “a lot or almost complete relief” from opioid dependency following the usage of cannabis.¹²

So what prevents physicians from prescribing cannabis for therapeutic purposes (CTP) as a substitute to opioids? In short, obtaining CTP in Canada is a tedious process. A study conducted by Belle-Isle and colleagues identified four barriers impeding Canada’s CTP program: accessibility, availability, affordability, and acceptability.^{4,13} Researchers determined that it is extremely difficult for Canadians with chronic pain to find a physician willing to support their application for CTP. The stigma and controversy surrounding CTP has been shown to strain patient-physician relationships, leaving patients with only opioids and thus further fueling the epidemic. Only 7% of patients access CTP from authorized dispensaries and the majority seek CTP from illegal sources due to the principal issue of unaffordability and compounded by strained patient-physician relationships.^{4,12} Despite the countless studies in support of cannabis as a safe and effective treatment for patients with chronic pain, the College of Physicians and Surgeons of Ontario refuses to endorse cannabis as a first-line antinociceptive therapy.¹³⁻¹⁵ Yet, a *JAMA* study reports that American states with medicinal cannabis laws have a 24.8% lower mean annual opioid overdose mortality rate compared to states without medicinal cannabis laws, providing compelling evidence in support of the harm-reduced substitution effect.¹⁶

The current prohibition of cannabis in Canada has proven ineffective; public perception indicates that a revision of legislation is necessary. It is also clear that re-evaluating restrictions on CTP and further legalization is required to ensure that patients suffering from chronic pain can receive adequate access. Canadian physicians, researchers, and policy makers need to step up to address the opioid epidemic. Further research on cannabis as a viable treatment alternative in Canada and continued exploration of the possible effects of legalization are needed to change physician-patient relationships and to clarify the controversy surrounding medicinal cannabis.

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- Hajizadeh M. Legalizing and regulating marijuana in Canada: review of potential economic, social, and health impacts. *International Journal of Health Policy and Management*. 2016;5(6): 453. Available from: <http://dx.doi.org/10.15171/IJHPM.2016.63> [Accessed 23rd Oct 2017].
- Savas D. Public opinion and illicit drugs: Canadian attitudes towards decriminalizing the use of marijuana. P. Basham (éd.). *Sensible solutions to the urban drug problem*, Vancouver, The Fraser Institute. 2001. Available from: <https://www.fraserinstitute.org/sites/default/files/SensibleSolutionsSavas.pdf> [Accessed 23rd Oct 2017].
- Forum Research Inc.(2017). Support for marijuana legalization steady at more than half. [online] Available at: [http://poll.forumresearch.com/data/011cc56c-icc2-4aef-b005-f8f5c5ec0570Federal%20Marijuana%20News%20Release%20\(2015%2008%2020\)%20Forum%20Research.pdf](http://poll.forumresearch.com/data/011cc56c-icc2-4aef-b005-f8f5c5ec0570Federal%20Marijuana%20News%20Release%20(2015%2008%2020)%20Forum%20Research.pdf) [Accessed 23rd Oct 2017].
- Lucas P, Walsh Z, Crosby K, Callaway R, Belle Isle L, Kay R et al. Substituting cannabis for prescription drugs, alcohol and other substances among medical cannabis patients: the impact of contextual factors. *Drug and Alcohol Review*. 2016;35(3): 326-333. Available from: <http://dx.doi.org/10.1111/dar.12323> [Accessed 23rd Oct 2017].
- Lucas P. Rationale for cannabis-based interventions in the opioid overdose crisis. *Harm Reduction Journal*. 2017;14(1): 58. Available from: <http://dx.doi.org/10.1186/s12954-017-0183-9> [Accessed 23rd Oct 2017].
- Fischer B, Russell C, Murphy Y, Kurdyak P. Prescription opioids, abuse and public health in Canada: is fentanyl the new centre of the opioid crisis?. *Pharmacoeconomics and Drug Safety*. 2015;24(12): 1334-1336. Available from: <http://dx.doi.org/10.1002/pds.3901> [Accessed 23rd Oct 2017].
- Barnett ML, Olenski AR, Jena AB. Opioid-prescribing patterns of emergency physicians and risk of long-term use. *New England Journal of Medicine*. 2017;376(7): 663-673. Available from: <http://dx.doi.org/10.1056/NEJMs1610524> [Accessed 23rd Oct 2017].
- Calignano A, La Rana G, Giuffrida A, Piomelli D. Control of pain initiation by endogenous cannabinoids. *Nature*. 1998;394(6690): 277-281. Available from: <http://dx.doi.org/10.1038/28393> [Accessed 23rd Oct 2017].
- Ellis RJ, Toperoff W, Vaida F, Van Den Brande G, Gonzales J, Gouaux B, Bentley H, Atkinson JH. Smoked medicinal cannabis for neuropathic pain in HIV: a randomized, crossover clinical trial. *Neuropsychopharmacology*. 2009;34(3): 672-680. Available from: <http://dx.doi.org/10.1080/02791072.2011.51074766> [Accessed 23rd Oct 2017].
- Reiman A, Welty M, Solomon P. Cannabis as a substitute for opioid-based pain medication: patient self-report. *Cannabis and Cannabinoid Research*. 2017;2(1):160-6. Available from: <http://dx.doi.org/10.1089/can.2017.0012> [Accessed 23rd Oct 2017].
- Troutt W, DiDonato M. Medical cannabis in Arizona: patient characteristics, perceptions, and impressions of medical cannabis legalization. *Journal of Psychoactive Drugs*. 2015;47(4): 259-266. Available from: <http://dx.doi.org/10.1080/02791072.2015.1074766> [Accessed 23rd Oct 2017].
- Belle-Isle L, Walsh Z, Callaway R, Lucas P, Capler R, Kay R et al. Barriers to access for Canadians who use cannabis for therapeutic purposes. *International Journal of Drug Policy*. 2014;25(4): 691-699. Available from: <https://doi.org/10.1016/j.drugpo.2014.02.009> [Accessed 23rd Oct 2017].
- Webb C, Webb S. Therapeutic benefits of cannabis: a patient survey. *Hawaii Journal of Medicine & Public Health*. 2014;73(4): 109. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3998226/> [Accessed 23rd Oct 2017].

Marijuana use is increasing throughout Canada, seemingly in anticipation of its impending legalization by Justin Trudeau's Liberal government.¹⁷ There are two ways to speculate about the health ramifications of this decision: firstly, by looking through a historical lens at the shift in public opinion on tobacco products in response to emerging scientific evidence, and secondly, by examining the alarming precedent set by marijuana decriminalization elsewhere in the world, such as in Colorado, USA.¹⁸

Beginning in the early 20th century, tobacco use and cigarette smoking exploded in popularity.² Anti-smoking sentiment quickly emerged, but it was backed only by moral or religious arguments. Credible science lagged decades behind. Through unrestricted advertising, tobacco companies baselessly dubbed their products "healthy". When concerns about tar and nicotine were raised, they were countered by "healthier" products with reduced tar and nicotine rather than real change. Corrupt researchers funded by tobacco companies published findings discrediting scientific evidence demonstrating smoking's negative health effects. Even with the release of the Surgeon General's report in 1964, which broadcasted the concrete link between smoking and cancer, public understanding of tobacco's negative health effects remained inadequate well into the 1980s.¹⁸

However, this viewpoint is not about cigarettes. Marijuana is much "healthier" anyway, right? The answer: we don't know. Smoking's role in lung cancer became evident

only because its effect size was so enormous that global cancer rates skyrocketed. Yet, a decades-long time lag masked the insidious danger posed by tobacco, all the while smoking spread like wildfire.¹⁸ Let this disaster forewarn of the danger posed by incomplete scientific understanding and public complacency regarding the adverse health effects of recreational substances.

So what are these adverse effects? Colorado was among the first American states to legalize marijuana, and much can be learned by observing its struggle with the resultant health impact, which has spanned human development from childhood to adolescence and adulthood.¹⁹ In the two years post-legalization, 14 children were admitted to the emergency department due to accidental ingestion of marijuana, compared to only 2 for accidental ingestion of alcohol. Before legalization, there had been zero admittances in a five-year period.²⁰ Most of this phenomenon can be attributed to the accessibility of candied marijuana products, which are indistinguishable from un-drugged treats.²⁰ Exacerbating this issue, the concentration of the active ingredient of marijuana, tetrahydrocannabinol (THC), is poorly regulated and can exceed recommended intoxication levels by up to 10-fold.^{4,5} THC concentrations in street marijuana have increased over recent decades.²¹

In adults, this increases overdose frequency, and delirium severity; in children, effects can be as serious as respiratory arrest.¹⁹ Therefore, marijuana legalization has created a novel health hazard ensnaring



our youngest and most vulnerable.

In adolescents, the problem is compounded. Ingestion becomes deliberate rather than accidental. The teenage mind is still developing, with key processes such as synaptic pruning and myelination only beginning to refine and cement neural circuitry. Marijuana impairs learning, memory, attention, and general neuropsychological function. These acute effects subside in adults only after prolonged abstinence, condemning regular users to a perpetually intellectually impaired state. Animal and human studies indicate that adolescents are more vulnerable to marijuana's adverse effects, with a strong likelihood of permanent marijuana-induced impairment and progressive cognitive decline in early life (ages 13-38). The endocannabinoid system, an important regulator of neurodevelopment and a key candidate for perturbation by cannabis consumption, may drive this finding.²¹ Furthermore, there is evidence suggesting that adolescent cannabis use increases the risk for anxiety and depression in young adulthood.²² This is especially relevant given that Canadian youth are among the top users of marijuana in the developed world, consuming marijuana at over twice the rate of adults over 25.¹⁷

Approximately 9% of marijuana users become addicted. Prolonged heavy cannabis use has been associated with educational

underachievement and impaired motivation. This is possibly due to THC's capacity to interfere with reward-based learning via attenuation of endogenous dopamine synthesis and signalling. Importantly, marijuana is strongly linked to schizophrenia, with its usage accounting for 8-14% of all cases. Acute marijuana use can induce both positive and negative symptoms of schizophrenia; chronic marijuana use increases schizophrenia risk by 2-6 fold depending on its THC concentration.⁵ This effect is exacerbated in genetically susceptible individuals.²¹

In sum, history cautions us against drugs publicly believed to be harmless, or even medically beneficial, in discordance with scientific evidence. It is especially wise to be wary of medical claims made by dispensaries and drug users. Mistaken public views regarding tobacco smoking required almost a century to be dispelled in North America, and still remain in many parts of the world. Similarly, public opinion on cannabis products regards them as innocuous, or even "healthy" today. Meanwhile, adverse health effects of marijuana include addiction, cognitive deficits, educational underachievement, and mental health issues. And all that is only what we know of now. Imagine what we could discover with the whole Canadian public as our research subjects! ■

14. Lucas P. Regulating compassion: An overview of Canada's federal medical cannabis policy and practice. *Harm Reduction Journal*. 2008;5(1):5. Available from: <https://doi.org/10.1186/1477-7517-5-5> [Accessed 23rd Oct 2017].
15. Lucas P. Moral regulation and the presumption of guilt in Health Canada's medical cannabis policy and practice. *International Journal of Drug Policy*. 2009 Jul 31;20(4):296-303. Available from: <https://doi.org/10.1186/1477-7517-5-5> [Accessed 23rd Oct 2017].
16. Bachhuber M, Saloner B, Cunningham C, Barry C. Medical cannabis laws and opioid analgesic overdose mortality in the United States, 1999-2010. *JAMA Internal Medicine*. 2014;174(10): 1668-1673. Available from: <https://doi.org/10.1001/jamainternmed.2014.4005> [Accessed 23rd Oct 2017].
17. Marijuana and Youth [Internet]. 2017 [cited October 18th 2017]. Available from: <http://www.ccdus.ca/Eng/topics/Marijuana/Marijuana-and-Youth/Pages/default.aspx>.
18. The Health Consequences of Smoking—50 Years of Progress: A Report of the Surgeon General [Internet]. 2014 [cited October 18th 2017]. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK179276/>.
19. Monte AA, Zane RD, Heard KJ. The implications of marijuana legalization in Colorado. *JAMA*. 2015; 313(3): 241-242. Available from: <https://jamanetwork.com/libaccess.lib.mcmaster.ca/journals/jama/fullarticle/2022370>. [Accessed October 12th 2017].
20. Wang GS, Roosevelt G, Heard K. Pediatric marijuana exposures in a medical marijuana state. *JAMA Pediatrics*. 2013; 167(7): 630-633. Available from: <https://jamanetwork.com/libaccess.lib.mcmaster.ca/journals/jamapediatrics/fullarticle/1691416> [Accessed October 13th 2017].
21. Volkow ND, Swanson JM, Evins AE, DeLisi LE, Meier MH, Gonzalez R, Bloomfield MA, Curran HV, Baler R. Effects of cannabis use on human behavior, including cognition, motivation, and psychosis: a review. *JAMA Psychiatry*. 2016; 73(3): 292-297. Available from: <https://jamanetwork.com/libaccess.lib.mcmaster.ca/journals/jamapsychiatry/fullarticle/2488041> Accessed October 12th 2017.
22. Hayatbakhsh MR, Najman JM, Jamrozik K, Mamun AA, Alati R, Bor W. Cannabis and anxiety and depression in young adults: a large prospective study. *Journal of the American Academy of Child & Adolescent Psychiatry*. 2007 Mar 31;46(3):408-17. Available from: https://journals-scholarsportal-info.libaccess.lib.mcmaster.ca/details/08908567/v46i003/408_caaadiya.xml [Accessed October 14th 2017].

EDITED BY VALERIE KIM & OWEN LUO

