# MARIJUANA

EVOLVE Newsletter: Volume 3, Issue 1

Prepared by Alexander Mok, Newsletter Editor

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# Cannabis 101: Canadian Laws, Access, Documentation & Pharmacology of Cannabis

by Clarence Lam (2T0), Vice-President

Access to cannabis in Canada has long been a major topic of debate for the Canadian government. With the legalization of recreational cannabis in Canada fast approaching in July 2018, aspects like regulation, production, sales and enforcement have yet to be finalized.[1] On the other hand, access of medical cannabis is currently governed under the Access to Cannabis for Medical Purposes Regulations (ACMPR), which replaced the Marijuana for Medical Purposes Regulations (MMPR) as of August 24, 2016.[2] The ACMPR allows patients to obtain access to cannabis for medical purposes but they must get a medical document from an authorized health care practitioner. A medical document is very similar to a prescription as it requires the authorized health care practitioner's name, license number, address of practice, the patient's name and date of birth, a specified period of use of up to one year and a quantity of dried cannabis expressed in grams.[3] Currently, the only health care practitioner authorized to write medical documents for patients are physicians registered with the College of Physicians and Surgeons of Ontario (CPSO).

*So what is cannabis and how does it work?*

Cannabis acts on the endocannabinoid system found in all vertebrates. The endocannabinoid system is a signalling system containing cannabinoid receptors, ligands and enzymes that play an important role in regulating functions throughout the human body. Since cannabinoid receptors are highly concentrated in the brain and central nervous system, the endocannabinoid system is implicated in large number of human processes like immune function, metabolism, cardiovascular function, stress, memory, pain, learning and many more.[4]

Cannabis is a plant that contains over 400 chemical compounds but one of the main compounds of interest is cannabinoids (THC/CBD). Cannabinoids must be activated through decarboxylation of THCA and CBDA to the active THC and CBD respectively. This can be achieved through the actions of smoking, vaporizing or heating. Among the cannabinoids, delta-9-tetrahydrocannabinol (THC) is responsible for most of the physical and psychotropic effects while cannabidiol (CBD) has less psychotropic activities due to less interaction with cannabinoid receptors.[5,6] Psychotropic activities of THC can impair cognition, memory, concentration, reaction, motor coordination, which all have important implications in activities like vehicular driving.[4] Thus, medical cannabis strains often have less THC and more CBD to reduce psychotropic effects. Terpenoids like pinene and limonene are among the other compounds and are thought to contribute to the differences in smoking qualities and fragrances. Terpenoids are also believed to have some anti-oxidant, anti-inflammatory, anti-bacterial activity among other broad spectrums of action.[5]

Overall, cannabis is very complex and contains a high number of cannabinoids. Cannabis exists in multiple dosage forms (dried, oils, etc.) which can have different effects on the body. More studies and evidence on cannabis are needed in order for Canada to make an informed decision on how cannabis fits in our society, whether it is used recreationally or medically.

# Summary of EVOLVE's Journal Club Discussion: Recreational & Medical Marijuana with Chirag Dave

transcribed by Cindy Hong (2T0), Events Coordinator

With the legalization of marijuana and the recent news that recreational marijuana will be regulated by LCBO, it's important to think about where the role of the pharmacist will fit into all of this. EVOLVE hosted Chirag Dave (pictured) at our Journal Club. Chirag is a pharmacist by training and became engaged in the Canadian Medical Cannabis Industry in 2014, after having experienced the benefits of the medication firsthand while receiving chemotherapy and radiation for Hodgkin's Lymphoma. Here's some of the highlights from the conversation:

*How will recreational and medicinal marijuana differ? Which one would be more potent?*
Chirag Dave: Recreational marijuana will be more expensive and less potent making medical marijuana more appealing and accessible.

*Wouldn't creating more criteria for MDs for prescribing medical marijuana make people more inclined to buy it through the black market?*
CD: Well, the doctors will also be more inclined to give people marijuana to prevent people from going to the black-market. It's working in Colorado; there is now more use of prescription marijuana oils. It allows people to go, "Hey, I've been a long-time user; I would like a prescription for it."

*How will pharmacies look different?*
CD: At a pharmacy, we are most likely going to dispense pre-packaged marijuana. There's likely going to be some emerging over the counter products too.

*I can see how having it at a pharmacy will make it convenient for the patients as well; on their way to pick up their regular medication, they can also get their medical marijuana. But, I feel like there's a generation gap. Not a lot of pharmacists are comfortable and prepared to answer this question.*
CD: That's very true. The profession needs to make better use of this momentum. That's why we are here giving this talk. We hope that you guys will go out and learn more about it so there's more advocacy and the profession can get in the frontlines of all this.

(Continued on page 5)

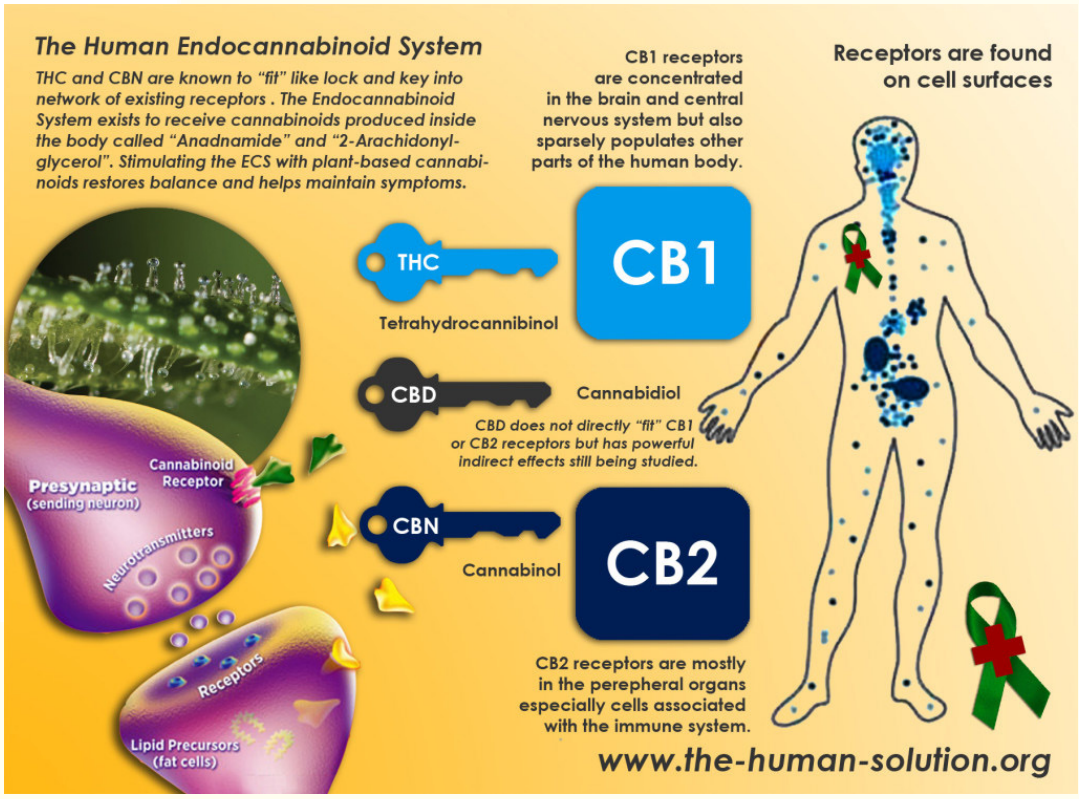
*What can we expect from Cannabis Control Board of Ontario (CCBO) and their staff?*
CD: There is quite a gap in the information that Health Canada has provided. We really don't know how much training and education these store-front people will have. But they do guarantee that their staff will be knowledgeable—to what is extent is the question.

*What kind of advertising will we see? How will our city look different?*
CD: Marijuana ads are probably going to resemble alcohol ads. On television, you'll find everybody having a great time but the marijuana will not be explicitly used. There will be no billboards for it. Also, there will likely be "bars" specifically for marijuana use. Public use will likely be illegal; people will be ticketed for it.

*When a recreational user buys marijuana, they will care about the taste, the "high" and the aftermath of it all as opposed a medicinal user. In healthcare, "trying" out the product will frankly be absent. Wouldn't this shift people back to black market for a better quality "high"?*
CD: That's a great point. It is possible. We have to see how this unfolds.

*How will this play out in terms of insurance? I've heard some stories of U.S. citizens having their insurance premium go up after reporting that they have never used marijuana but are trying to obtain medical marijuana.*
CD: That's likely not going to happen here. I don't see how such things can occur in Canada.

*I heard that Health Canada will allow people to grow their own marijuana plants…Wouldn't this negate all this regulation that's happening?*
CD: Yes, some people will be given permits to grow in their homes. I believe it is four marijuana plants of any height. If people want to grow more, they need a production license. But, it's like brewing your own beer. It's fun the first-time but it's hardly a task everyone wants to do on a regular basis!



# Current Best Practice on Medical Marijuana

by Roshni Patel (2T0), Social Representative

There has been much controversy surrounding medical marijuana, some due to stigma, and some due to lack of evidence regarding its efficacy and safety. This lack of evidence poses a challenge for pharmacists and future pharmacists, who will need to interpret the information currently available in order to apply it to practice.

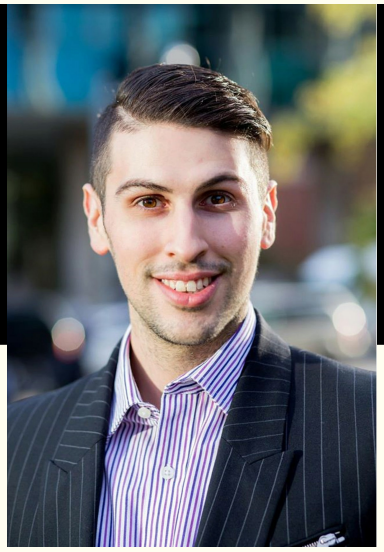
Health Canada has information regarding medical marijuana for healthcare professionals.[7] While not entirely comprehensive, it is meant to complement other evidence currently available. The document looks at both cannabis as well as prescription cannabinoids (i.e. nabilone, dronabinol and nabiximols). It includes information on the chemistry of cannabinoids, pharmacokinetic and pharmacodynamic properties, dosages, toxicity, and potential therapeutic uses. Within it, the document also attempts to compare strengths between dosage forms. Regarding prospective indications, each discussed includes a description of clinical studies used to evaluate the uses. The possible therapeutic uses include palliative care, nausea and vomiting, wasting syndrome and loss of appetite, multiple sclerosis (MS), epilepsy, and pain among other conditions that have been studied in the therapeutic use of medical cannabinoids.

A systematic review in The Annals of Internal Medicine looked at the effects and general harms of cannabis among adults with chronic pain.[8] It reviewed the effects on neuropathic pain, MS, cancer pain, and "other or mixed pain conditions." In neuropathic pain, the improvements lasted 2-3 weeks with no long-term effects reported, and the two largest included RCTs showed no clinical significance in the improvement of neuropathic pain.[8] The studies regarding cancer pain had an unclear risk of bias (ROB), thus the review decided there was inconclusive evidence in this indication.[8] This study also found insufficient evidence in MS pain alleviation with medical cannabis.[8] Another systematic review from 2015 evaluated 79 trials, with only four showing a low ROB.[9] Authors concluded that the evidence supporting cannabinoids for chronic pain and spasticity to be moderate, while evidence for chemotherapy-induced nausea and vomiting, weight gain in HIV infection, sleep disorders, and Tourette's syndrome to be low quality.[9] Chirag Dave's presentation at EVOLVE's Journal Club included information about evidence available for MS and for pain. In MS, studies showed an improvement in muscle stiffness, and in spasticity reduction.[10-13]

As demonstrated, the evidence surrounding medical marijuana is both varied and inconclusive. While high quality evidence supporting or opposing the use of cannabis and/or cannabinoids therapeutically is lacking, new studies are being conducted, especially as recreational and medicinal marijuana is becoming legalized globally, including in Canada. However, with the current evidence available, healthcare professionals and students should be vigilant in appraising literature when applying it to practice.

# Research Highlights: Cannabinoids & Neuropathic Pain

by Sasha Farina (IT9), Communications Representative



*Literature Review:* Meng H, Johnston B, Englesakis M, et al. (2017). Selective cannabinoids for chronic neuropathic pain: a systematic review and meta-analysis. *Anesth and Anal.* 125(5):1638-1652.[14]

Cannabinoids have been used and continue to be investigated for their roles in pain relief. However, there is still much research that needs to be done to confirm their indications and place in clinical practice. Cannabinoids do have potential benefits in neuropathic pain, however, there is a lack of consensus on how they should be used, which is manifested through discrepancies among clinical guidelines.[15-16]

A recent systematic review and meta-analysis set out to investigate the role of cannabinoids in neuropathic pain.[14] They searched for RCTs that compared the synthetic cannabinoids dronabinol, nabilone and nabiximols with conventional treatments for neuropathic pain. They found 11 eligible trials which were combined to form meta-analysis. They found that overall cannabinoid use was associated with a small reduction in numerical rating scores for neuropathic pain (0-10 scales) compared to conventional treatments (see Figure 2, below). However, this reduction was very small and not likely to be clinically significant (−0.65 points; 95% CI: −1.06 to −0.23). They also found that nabilone on its own did not yield an overall significant reduction in pain scores, but nabiximols and dronabilone did.

However, there were many issues with the study. There was significant heterogeneity amongst trial designs, methods of reporting, variable cause(s) of the neuropathic pain that the patients had, and differences in the dosing regimens of the cannabinoids. Further research needs to be performed to clarify optimal dosing of cannabinoids and also determine if their roles would change depending on the etiology of the neuropathic pain. Furthermore, other outcome measures besides simple pain rating scales should be explored. For instance, a growing area of interest is how cannabinoids affect inflammation physiology. It is believed that they act through different mechanisms than NSAIDS, however this requires further exploration.

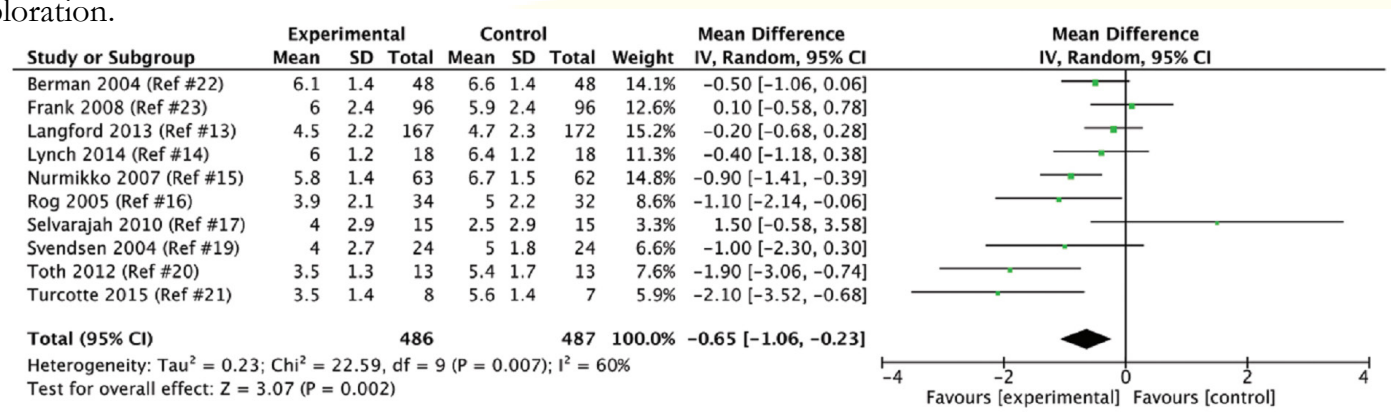
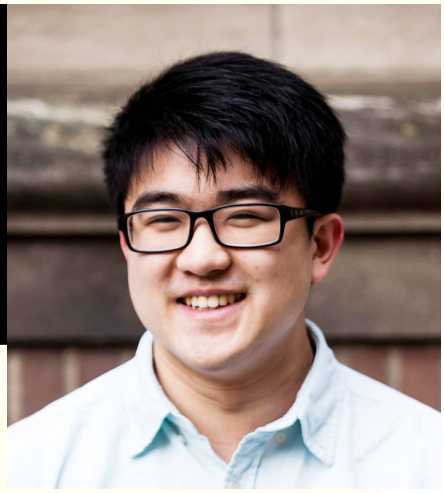



**Figure 2.** Forest plot of analgesic efficacy (pain Numerical Rating Scores) of selective cannabinoids.

# Economic Analysis of Legalization of Recreational Marijuana in Colorado & Relation to Canada`s Future



by Jon Nhan (IT9), Event Coordinator

With the legalization of recreational marijuana looming on the Canadian horizon, much interest exists around its economic potential. To design a legal cannabis system, there are policy and economic implications that need to be considered. Although Canada will soon be joining other nations in the world that legalize the production, distribution and sale of cannabis, there are some lessons to be learned from other jurisdictions.

Colorado was one of the first states to legalize recreational cannabis, and thus has one of the maturest markets for cultivation, distribution and retail. In 2015, marijuana had an economic impact of $2.4 billion in state output and created over 18,000 new full time equivalent positions of which, 70% were directly involved in marijuana business and the other 30% were ancillary positions.[17] In Colorado, it is the fastest growing economic sector and is second only to government program spending in generating more local output and employment per dollar spent. With an excise tax of 15% and since legalization, the state has collected over $600 million in tax revenues.[18]

Demand for marijuana in Colorado is projected to grow by 11.3% per year until 2020 and will be saturated at peak sales of $1.5 billion as volume of sales grow but prices decline.[17] The large growth is driven by consumers transitioning toward legal outlets and away from the black market. However, it is projected to have continued modest growth of 2.0-3.1% per year beyond saturation.[17] Among other excise products like tobacco and alcohol, recreational marijuana was the second largest revenue source with $121 million in combined sales and excise tax.[17] Marijuana total tax revenues are behind tobacco, threefold larger than alcohol and 14% larger than casinos.[17]

With marijuana being the second most consumed substance in Canada, questions arise regarding its economic potential.[19] The projections that have been made are mixed. The Parliamentary Budget Office has a conservative market projection between $5.5-5.8 billion.[20] But based on a report from CIBC that extrapolated data from Colorado to the Canadian population, it was suggested that it could become a $10 billion a year industry.[21] Furthermore, if taxed similarly to other excise products, the federal and provincial governments could receive substantial tax revenues.[21] Deloitte estimates a base market of $4.9-8.7 billion.[22] However, also including ancillary markets increases this projection to above $22.6 billion a year.[22]

Although there may be many potential financial benefits like job creation and economic growth, there are still some important fiscal and public health policies that need to be considered in Canada's plan for legalizing recreational marijuana. The federal and provincial government must be careful in applying an excise tax that may push the price of legal cannabis significantly above black-market prices. Attention must also be given towards the increasing use of the drug in relation to motor-vehicle accidents and drug-related complications. Ultimately, the impact of legalization of cannabis will be unknown until it has been implemented across Canada.

## Want to get involved with EVOLVE?

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