March 15, 2017 **HB 2152**

Testimony from Kate M. Bell, Legislative Counsel, Marijuana Policy Project, in support of HB 2152

Dear Members of the House Committee on Health and Human Services:

My name is Kate Bell, and I serve as legislative counsel for the Marijuana Policy Project, the nation's largest organization dedicated exclusively to marijuana policy. MPP has worked on, and in many cases, drafted or assisted in the drafting of many of the nation's medical cannabis laws that have been adopted since 1996.[1] As a nonprofit public interest advocacy organization, one of our primary missions is to ensure patients with debilitating medical conditions who could benefit from medical cannabis are able to access it safely and legally. We also work hard to ensure medical cannabis laws create carefully regulated programs that the public will be proud of.

I am writing today to support HB 2152. We thank Rep. John Wilson for sponsoring this important legislation, which would provide relief to people suffering from serious medical conditions.

I. Purpose and Scope of this Legislation

House Bill 2152 would establish a regulatory framework for a system to provide patients access to oils and other preparations containing cannabidiol, or CBD — one of several active ingredients (called cannabinoids) contained in the plant Cannabis sativa L. Unlike comprehensive medical marijuana programs, this system would be limited to forms of the plant that are very low in THC (the psychoactive ingredient), but rich in CBD. While CBD has no psychoactive effect, thousands of patients across the U.S. have found it helps reduce the severity and frequency of seizures, and helps treat various other conditions as well.

There are important differences between this approach and those used in states with broad medical marijuana programs. Aside from the fact that the products are limited to low amounts of THC (capped at 3%), this bill would establish a relatively small state program. Business activity would be modest. Indeed, this bill provides for as few as three businesses to supply CBD-rich cannabis preparations to the entire state of Kansas.

In some states there are several different types of businesses which need to be licensed and supervised, but this bill establishes just two types of business: those entities that cultivate, process, and provide CBD-rich cannabis preparations, and independent testing labs to ensure that products are safe and that they are what they purport to be. Patients may not grow their own medicine under this system.

Further, the products made available here contain little value on the illicit market. While security is an important component of the proposed regulations, diversion into the underground market is not the concern it might be in those states with broader programs.

It should be noted that a drug that contains 100% THC (and no CBD) is already available to patients. It is an FDA-approved drug called Marinol (generic name Dronabinol).[2] Unfortunately, because it contains all THC

[1] This bill refers to the products as "medical hemp." Both "marijuana" and "hemp" refer to the cannabis plant, Cannabis sativa L. Typically, the term "hemp" is used to refer to industrial varieties containing low amounts of THC, while "marijuana" generally refers to plants with more THC than would be allowed under HB 2152. Different states with CBD laws, discussed below, have set different limits on the amount of THC allowed. In addition, different states' medical laws use different terminology.

[2] See http://www.webmd.com/drugs/2/drug-9308/marinol-oral/details

and no CBD, it can cause serious side effects by making a patient feel very "high" and unable to function in day-to-day life. That is because CBD has neuroprotective properties that actually counteract some of the psychoactive effects of THC. Marinol also lacks the beneficial effects of CBD. CBD and THC work together in what is called the "entourage effect." As Dr. Sunil Kuman Aggarwal, M.D. Ph.D., an expert who has researched medical cannabis extensively, explains: "Many patients find that natural cannabis works better than Marinol (the THC pill) for them. Marijuana's many cannabinoids and terpenes work synergistically. Other components balance out the negatives of THC, while enhancing the benefits." A drug that contained all CBD and no THC would also be less effective due to this synergistic effect.

II. The importance of in-state access and laboratory testing

Currently, 15 states have established laws that try to implement regulated access to CBD products: Alabama, Georgia, Iowa, Kentucky, Mississippi, Missouri, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Utah, Virginia, Wisconsin, and Wyoming. Unfortunately, nearly every one of them has created a system that is unworkable. That is because they typically either have no provisions for in-state access, only allow federally approved Epidiolex studies — which only a few patients can participate in — or rely on risk-averse actors (like doctors, or hospitals that receive federal funding) breaking federal law. Until federal law changes, which could take years, most of these laws will be of little or no help to patients.

Telling patients that they can access a treatment that can ease their suffering, but then offering them no place to purchase that treatment without crossing state lines and risking arrest, **is cruel and unnecessary**. While patients could theoretically drive to Colorado to purchase marijuana there, it may be difficult for them to ensure that what they are purchasing complies with Kansas law, since Colorado allows many types of both medical and recreational products made from cannabis, with various levels of THC and CBD.[3] In addition, driving across state lines carries additional risks, and seriously ill patients should not have to drive up to *twelve hours* (from Kansas City to Colorado and back) every month or two just to obtain medicine.

This bill borrows heavily from the one low-THC medical cannabis system that is functional — Missouri's. Missouri is the only program where regulated stores in the state are licensed to sell CBD oil to patients. But, it is important to note that only Missouri residents may purchase CBD products under Missouri's program,[4] so those stores would not be accessible to Kansans even if Kansas' law were changed to permit possession of those products.

HB 2152 also implements important additional features that are a part of many successful and well-regulated programs in states with comprehensive laws. We believe **this bill represents the state-of-the-art when it comes to CBD regulation.** For example, **the inclusion of laboratory testing is critically important**. Unfortunately, many companies are selling products online that claim to be "CBD oil." But, the FDA found that many of these products contain only trace amounts of CBD or any other cannabinoids.[5] These companies are preying on parents and patients who are desperate for something to ease their suffering and are purchasing "snake oil." When products that are tested by independent labs, patients will know what they are purchasing. Products will also be tested for safety, for example, to ensure that it is not contaminated with pesticides. This is important because if patients resort to purchasing medicine in the unregulated criminal market, they will have no idea how it was produced or what chemicals were used to grow it.

[3] In fact, the average THC content in Colorado is 18.7%, as compared to the 3% allowed under this law.
[4] Missouri Department of Health and Senior Services, "Hemp Extract Registration Card," at http://health.mo.gov/about/proposedrules/hempextract.php
[5] FDA, "2015 Warning Letters and Test Results for Cannabidiol-Related Products," https://www.fda.gov/NewsEvents/PublicHealthFocus/ucm435591.htm

III. Federal Law

It is true that marijuana possession and distribution — even for medical purposes — is a federal crime under the Controlled Substances Act (CSA). The federal definition of "marijuana" includes most, but not all, parts of the cannabis plant. **Unfortunately, CBD products, because they are derived from cannabis, remain illegal under federal law according to the Drug Enforcement Administration (DEA)**, despite all the evidence of their medical efficacy.

There is a limited exception under federal law that makes hemp products legal, but this only applies to products derived from the stalk or seed of the cannabis plant. It is not possible for CBD products to be made from the stalk of seeds of the plant because they do not contain enough cannabinoids. Instead, CBD products would be made from the flowering tops of the cannabis plant.[6] To comply with Kansas law, these would be cannabis plants bred to contain low amounts of THC.

Due to our unique federal system of government, however, **state medical cannabis programs are not pre-empted by federal law**. The U.S. system of government is one of dual sovereignty where the states can and do serve as "laboratories of democracy." The question of federal pre-emption is a question of congressional intent. The CSA makes it clear it only pre-empts state laws under very limited circumstances. 21 U.S.C. 903 says it is not intended to pre-empt the field of drug laws if "there is a positive conflict" between state and federal law "so that the two cannot consistently stand together." Courts have generally held that a state law is only pre-empted by the CSA if it is "physically impossible" to comply with both state and federal law or if the state law stands as an obstacle to the CSA. Neither is the case with carefully crafted state medical cannabis or CBD programs. A state law — or a portion of it — would be pre-empted under the impossibility pre-emption if it *required* someone to violate federal law. For this reason, effective medical cannabis laws do not require state workers to grow or dispense cannabis in violation of federal law; they just regulate private individuals who choose to do so. *Requiring* someone to break federal law is quite different from *allowing* and *regulating* conduct under state law.

When discussing pre-emption, it's important not to forget about the Tenth Amendment. The federal government is free to enforce its own marijuana laws, but requiring state agents to enforce federal laws would be an unconstitutional commandeering of a state's resources.[7] As one court noted:

> It is of considerable consequence that it is Arizona's attempt at partial decriminalization with strict regulation that makes the AMMA vulnerable … This view, if successful, highjacks Arizona drug laws and obligates Arizonans to enforce federal prescriptions that categorically

[6] The DEA recently clarified this by stating: "As the scientific literature indicates, cannabinoids, such as tetrahydrocannabinols (THC), cannabinols (CBN) and cannabidiols (CBD), are found in the parts of the cannabis plant that fall within the CSA definition of marijuana, such as the flowering tops, resin, and leaves. According to the scientific literature, cannabinoids are not found in the parts of the cannabis plant that are excluded from the CSA definition of marijuana, except for trace amounts (typically, only parts per million)[3] that may be found where small quantities of resin adhere to the surface of seeds and mature stalk. Thus, based on the scientific literature, it is not practical to produce extracts that contain more than trace amounts of cannabinoids using only the parts of the cannabis plant that are excluded from the CSA definition of marijuana, such as oil from the seeds." (footnotes omitted). "Clarification of the New Drug Code (7350) for Marijuana Extract," available at https://www.deadiversion.usdoj.gov/schedules/marijuana/m_extract_7350.html

[7] See, *Printz v. United States*, 521 U.S. 898 (1997); *New York v. United States*, 505 U.S. 144 (1992). See also, *Gonzales v. Oregon*, 546 U.S. 243, 270 (2006) ("the structure and limitations of federalism … allow the States great latitude under their police powers to legislate as to the protection of the lives, limbs, health, comfort, and quiet of all persons.")

prohibit the use of all marijuana. The Tenth Amendment's "anti-commandeering rule" prohibits Congress from charting that course.[8]

The federal government has never alleged in court that federal laws pre-empt state medical marijuana laws.

In addition, the federal government is very unlikely to interfere in state programs. In fact, in many states that have already passed medical cannabis or CBD-focused laws, Congress has specifically forbidden the Department of Justice from interfering with those programs. For the past two years, **Congress has approved a rider to a DOJ appropriations bill that provides that the funds may not be used to interfere with the implementation of state medical marijuana laws**.[9] This rider, sponsored by Congressman Rohrabacher (R-CA), has been extended through late April 2017 and is expected to be part of the next Congressional appropriation as well.

In addition, since the August 2013 issuance of the "Cole memorandum" by then-assistant Attorney General James Cole, the DOJ has had a policy of not targeting well-regulated state medical marijuana providers. This policy is still in force, and President Trump has repeatedly expressed his support for medical marijuana and stated that he believes in federal non-interference in state marijuana laws.[10]

It is up to patients and potential providers to decide whether they want to take a risk by breaking federal law, and many desperate patients are already doing so. What state lawmakers can and should do is remove the barriers to relief that their *state* law poses to patients.

IV. Addressing Common Concerns

Because MPP has over two decades of experience working on this issue, we have significant insight into medical cannabis programs. We have seen what works and what does not. We have monitored and analyzed the growing body of data surrounding the medical benefits of cannabinoids and the experiences of states that have adopted laws that regulate cannabis for medical use. And, we are keenly aware of the concerns held by those on all sides of the matter.

It has now been more than 20 years since the first medical cannabis law was enacted in California in 1996, and we have had plenty of time to review data. Research has shown that these laws do not increase crime or youths' marijuana use. On January 12, 2017, after reviewing more than 10,000 scientific abstracts, The National Academies of Sciences, Engineering, and Medicine released a report that found no link between smoking cannabis and lung cancer, no physiological 'gateway' effect, and no link between cannabis use and mortality, overdose deaths, or occupational accidents.

In the early 2000s, the General Accounting Office (the investigative arm of Congress, now called the Government Accountability Office) interviewed officials from 37 law enforcement agencies in four states with medical marijuana laws. A key issue they examined was whether medical cannabis laws had interfered with enforcement of laws regarding nonmedical use. According to the GAO's November 2002 report, the majority of these officials "indicated that **medical marijuana laws had had little impact on their law enforcement activities**." Since then, the data has continued to accumulate, showing that medical marijuana laws are not causing public safety problems. Just last month, a new study was released showing that no state that has adopted medical cannabis laws has even experienced an increase in property-related crimes as a

[8] *White Mountain Health Center, Inc. v. Maricopa County*, CV 2012-053585 (Arizona Superior Court, Maricopa County, 2012).
[9] See: Consolidated and Further Continuing Appropriations Act of 2015, Section 538, Pub. L. 113-235, 128 Stat. 2130 (2014) and *U.S. v. Marin Alliance for Medical Marijuana*, No. C 98-00086 CRB, decided October 19, 2015.
[10] See https://www.mpp.org/federal/trump-marijuana-policy/

result. In Minnesota, law enforcement that had previously opposed medical cannabis recognized it did not create the problems they feared, and they did not object to the recent expansion of the program.

Opponents in some states have raised concerns that any access to medical cannabis could lead to widespread increases in teen use. Evidence shows that almost every state that has legalized medical cannabis has not seen an increase in teen use, and in some states, it has even gone down. In addition, unlike dangerous opioids, which caused 329 deaths in Kansas during 2015 alone, **there has never been a single documented death attributed to a cannabis overdose.**

V. Qualifying Conditions Under this Legislation

Despite all the obstacles the federal government has placed in the way of research on the therapeutic benefits of cannabis,[11] there is a large and growing body of research that supports its safety and efficacy to treat many different conditions, including the qualifying conditions in this legislation: epilepsy, cancer, multiple sclerosis (MS), Alzheimer's, and Post-Traumatic Stress Disorder (PTSD).

A. Epilepsy

This bill would greatly help many young people who are victims of seizure conditions. Thousands of patients across the country successfully use products containing CBD to help alleviate the severity and the frequency of seizures. This is the only qualifying condition in the bill for people under the age of 21.

Seizures are caused by abnormal electrical activity in the nervous system, sometimes described as an electrical storm in the brain.[12] As a result, a person's body shakes rapidly and uncontrollably as his or her muscles contract and relax repeatedly. Common symptoms include blackout periods, twitching and jerking limbs, drooling or frothing at the mouth, eye movements, grunting and snorting, loss of bladder or bowel control, sudden and uncontrolled falling, and teeth clenching.[13]

There are many different kinds of seizures, and causes vary widely. They can include abnormal levels of sodium or glucose in the blood, brain infection, brain injury or tumors, heart disease, Phenylketonuria (PKU), which can cause seizures in infants, and many other causes. Sometimes no cause can be identified. These are called idiopathic seizures, usually seen in children and young adults, but they can occur at any age. If seizures repeatedly continue after the underlying problem is treated, the condition is called epilepsy.[14]

Over two million people in the U.S. have some form of epilepsy, and there are about 150,000 new cases of seizure disorders including epilepsy diagnosed each year. One in 26 people in the United States will develop epilepsy at some point in their lifetime.[15] About one-third of people with epilepsy live with uncontrollable seizures because standard available forms of treatment do not work for them,[16] and it is for this group that products containing CBD show a great deal of promise.

Epilepsy affects more than 300,000 children under the age of 15 — and more than 90,000 young people have seizures that cannot be adequately treated. Children and adolescents are more likely to have epilepsy of

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[11] See: https://www.mpp.org/issues/medical-marijuana/federal-obstruction-of-medical-marijuana-research/

[12] University Of California, Berkeley, "Researchers Create Model Of Brain's Electrical Storm During A Seizure," *Science Daily*, March 1, 2005. http://www.sciencedaily.com/releases/2005/02/050224122911.htm

[13] U.S. National Library of Medicine, National Institutes of Health National Institutes of Health, MedlinePlus, http://www.nlm.nih.gov/medlineplus/ency/article/003200.htm

[14] *Id.*

[15] Patricia O. Shafer, RN, MN, "Epilepsy, the Basics," Epilepsy Foundation, http://www.epilepsy.com/learn/about-epilepsy-basics

[16] *Id.*

unknown or genetic origin.[17] Seizures are extremely dangerous, can be life threatening, and affect every part of a person's life.[18] For parents of children with seizure conditions, the stress can be overwhelming.[19] In fact, the trauma caused by this condition can cause Post-Traumatic Stress Disorder (PTSD) in both children suffering from epilepsy and their parents.[20,21]

CBD's positive effects on individuals with seizure conditions have frequently been headline news as more and more seriously ill patients and parents of children with seizure conditions seek relief through the use of CBD.[22] For example, a television special by well-known physician Dr. Sanjay Gupta brought particular attention to the therapeutic effect of CBD-rich cannabis oils on children with this condition.[23] Unfortunately, this treatment is not currently available in Kansas, and some residents have had to relocate to other states for treatment. HB 2152 provides a solution.

Quite simply, the Legislature should not stand between a doctor and a patient or, in the case of minors, that patient's family.

B. Cancer

Cancer comes in many forms, but for many people, the treatment includes chemotherapy and radiation. Unfortunately, that treatment itself causes tremendous suffering. In its 1999 report "Marijuana and Medicine: Assessing the Science Base," the Institute of Medicine concluded, "Nausea, appetite loss, pain and anxiety are all afflictions of wasting, and all can be mitigated by marijuana." Cannabinoids can both stimulate appetite and reduce the nausea, vomiting, and weight loss experienced by patients in many circumstances, including the side effects of drug therapies given for cancer.

Other studies which support using CBD to alleviate the symptoms of cancer treatment include a 1988 clinical trial sponsored by the state of New York, which found: "Fifty-six patients who had no improvement with standard antiemetic agents were treated and 78% demonstrated a positive response to marijuana ... **inhalation marijuana is an effective therapy for the treatment of nausea and vomiting due to cancer chemotherapy**."[24] A review of data from a series of state-sponsored clinical trials of marijuana for relief of nausea and vomiting caused by cancer chemotherapy conducted in the 1970s and 1980s concluded that patients who smoked marijuana experienced greater relief from nausea and vomiting that those taking Marinol.[25]

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[17] American Association of Neurological Surgeons, "Epilepsy," http://www.aans.org/Patient%20Information/Conditions%20and%20Treatments/Epilepsy.aspx

[18] Reviewed by Joseph I. Sirven, MD and Patricia O. Shafer, RN, MN, "Impact," Epilepsy Foundation, http://www.epilepsy.com/learn/impact

[19] WebMD, "Caring for a Child with Epilepsy," http://www.webmd.com/epilepsy/guide/caring-child-epilepsy

[20] Elmedina Dautovic, et. al, "Pediatric seizure-related posttraumatic stress and anxiety symptoms treated with EMDR: a case series," Eur J Psychotraumatol. 2016; 7: 10.3402/ejpt.v7.30123, available at https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4933792/

[21] Frank Muscara, et. al, "Parent distress reactions following a serious illness or injury in their child: a protocol paper for the take a breath cohort study," BMC Psychiatry. 2015; 15: 153, available at https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4495936/

[22] Lisa Bernard-Kuhn, The Cincinnati Enquirer, "Families move to secure medical marijuana for kids," USA Today, March 23, 2014, http://www.usatoday.com/story/news/nation/2014/03/23/families-move-to-secure-medical-marijuana-for-kids-/6755071/

[23] Dr. Sanjay Gupta, "Weed," CNN, August 11, 2013, http://www.youtube.com/watch?v=Z3IMfIQ_K6U

[24] Vincent Vinciguerra, et al., "Inhalation Marijuana as an Antiemetic for Cancer Chemotherapy," New York State Journal of Medicine (October 1988).

[25] Richard Musty and Rita Rossi, "Effects of Smoked Cannabis and Oral Δ 9-Tetrahydrocannabinol on Nausea and Emesis After Cancer Chemotherapy: A Review of State Clinical Trials," Journal of Cannabis Therapeutics 1, no. 1 (2001):43-56.

More recently, Dr. Guzman, a leading cancer researcher, examined the data regarding use of marijuana and cannabinoids in cancer treatment. He concluded that marijuana/ cannabinoids can be useful in preventing or treating "chemotherapy-induced nausea and vomiting." He also noted that cannabinoids have potential as antitumor agents: "Regarding effectiveness, cannabinoids exert a notable antitumour activity...**Regarding toxicity, cannabinoids not only show a good safety profile but also have palliative effects in patients with cancer**, indicating that clinical trials with cannabinoids in cancer therapy are feasible."[26] A 2010 double-blind, placebo-controlled clinical trial concluded that compared to the placebo, the whole plant cannabis "added to standard antiemetic therapy was well tolerated and provided better protection against delayed CINV [chemotherapy-induced nausea and vomiting]."[27] A literature review of many other studies found significant evidence for marijuana use improving appetite, nausea, and pain.[28] All but one of the studies analyzed noted an improvement in nausea, with smoked marijuana at least as effective as THC or synthetic cannabinoids (i.e. marinol) — with fewer side effects. Marijuana was also shown to effectively improve appetite, with one study showing improvements in appetite for those with wasting syndrome.

There are also numerous studies showing that CBD may inhibit the growth of some types of cancer.[29] For example: "The non-psychoactive cannabinoid cannabidiol (CBD) effectively inhibits the growth of different types of tumours in vitro and in vivo."[30] "Cannabidiol inhibits angiogenesis by multiple mechanisms . . . Its dual effect on both tumour and endothelial cells supports the hypothesis that CBD has potential as an effective agent in cancer therapy." While this data is preliminary and medical cannabis should of course not be used in lieu of other, established cancer treatments, neither should Kansas patients be criminalized for trying anything that might help them survive terminal cancer.

The use of medical cannabis to treat the side effects of chemotherapy and radiation is well established. Cancer is included as a qualifying condition in Georgia's CBD bill and **is a qualifying condition in all 28 states with comprehensive medical cannabis programs.**

C. Multiple Sclerosis

This condition is also included in Georgia's CBD medical marijuana bill and in many medical marijuana programs. **Clinical trials involving whole plant marijuana and various marijuana extracts have found that patients reported relief** of muscle stiffness, pain, and spasticity.[31] This is a neural degenerative

[26] Manuel Guzman, "Cannabinoids: Potential Anticancer Agents," Nature Reviews 3 (2003): 745-766.
[27] Marta Duran, et al., "Preliminary efficacy and safety of an oromucosal standardized cannabis extract in chemotherapy-induced nausea and vomiting," Journal of Clinical Pharmacology 70, no. 4 (2010): 656-63.
[28] Kramer, Joan L. (2015). "Medical Marijuana for Cancer," CA: A Cancer Journalfor Clinicians, 65(2): 109-122.
[29] McAllister, Sean D., et. al, "Pathways mediating the effects of cannabidiol on the reduction of breast cancer cell proliferation, invasion, and metastasis," Breast Cancer Research Treatment Journal 129: 37-47 (2011). Using human breast cancer cells grown in a culture, researchers observed CBD pathways to the down-regulation of inhibitors related to breast cancer. Researchers determined CBD acts as an inhibitor for human breast cancer. Similar results were observed when experimenting on immune competent mice, where treatment with CBD reduced both the size and mass of tumors.
[30] M. Solinas et. al, "Cannabidiol inhibits angiogenesis by multiple mechanisms," Br J Pharmacol. 2012 Nov;167(6):1218-31, available at http://www.ncbi.nlm.nih.gov/pubmed/22624859.
[31] For just some examples, please see the following studies:
1) Jody Corey-Bloom, et al., "Smoked cannabis for spasticity in multiple sclerosis: a randomized, placebo-controlled trial," Canadian Medical Association Journal 184, no. 10 (2012): 1143–1150. This placebo-controlled, crossover trial of 37 participants with multiple sclerosis and spasticity found that smoked cannabis was superior to placebos in reducing pain and spasticity. The authors recommended that, "Future studies should examine whether different doses can result in similar beneficial effects with less cognitive impact." There were no serious adverse events during the trial.
2) J. Zajicek, et al., "Multiple Sclerosis and Extract of Cannabis: Results of the MUSEC trial," Journal of Neurology, Neurosurgery & Psychiatry 83: no 11 (2012):1125-1132. This double blind, placebo controlled, phrase III clinical trial found that patients found almost twice as much relief from muscle stiffness from oral cannabis extract than from the placebo.

disorder; **cannabis has neuroprotective and anti-inflammatory properties, which can help treat these diseases**.[32] For example, one study found that:

> Cannabidiol (CBD), a non-psychotropic cannabinoid constituent of Cannabis sativa, has potent anti-inflammatory and immunosuppressive properties. . . CBD administration at the time of viral infection exerts long-lasting effects, ameliorating motor deficits in the chronic phase of the disease. . . . Together, our findings highlight the anti-inflammatory effects of CBD in this viral model of MS and demonstrate the significant therapeutic potential of this compound for the treatment of pathologies with an inflammatory component.[33]

D. Alzheimer's Disease

In preliminary research, THC has been shown to reduce agitation in severely demented Alzheimer's patients.[34] Preclinical research also suggests that marijuana components may help retard the progression of Alzheimer's disease. For example, one study found: "Alzheimer's disease is widely held to be associated with oxidative stress. . . . Here, we studied the effect of cannabidiol, a major non-psychoactive component of the marijuana plant (Cannabis sativa). . . . Our results indicate that cannabidiol exerts a combination of neuroprotective, anti-oxidative and anti-apoptotic effects . . . [and] cannabidiol is involved in the signaling

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3) J. Zajicek, et al., "Cannabinoids for Treatment of Spasticity and Other Symptoms Related to Multiple Sclerosis (CAMS Study): Multicentre Randomised Placebo-Controlled Trial," The Lancet 362 (2003): 1517-26. This trial, using an oral cannabis extract, reported "evidence of a treatment effect on patient-reported spasticity and pain (p=0·003), with improvement in spasticity reported in 61% (n=121, 95% CI 54·6–68·2), 60% (n=108, 52·5– 66·8), and 46% (n=91,39·0–52·9) of participants on cannabis extract, 9-THC, and placebo, respectively."

4) Collin, C., Davies, P., Mutiboko, I.K. & Ratclifee, S. (2007) "Randomized controlled trial of cannabis-based medicine in spasticity caused by multiple sclerosis," European Journal of Neurology 14: 290-296. This double-blind study compared the effects of a placebo versus a whole plant based treatment containing THC and CBD. Over a six-week period of use, 40% of the subjects treated with cannabis saw a reduction in spasticity of more than 30% and 17.5% saw a reduction greater than 50%. A number of subjects also saw an increase in muscle power in their legs, and 57% of the subjects experienced a global improvement in symptoms. The authors noted surprise at the low dropout rate of subjects for such a high dosage of THC, which the authors attributed to the CBD in the medicine. The authors concluded that cannabis-based medications could be useful in symptomatic relief of spasticity for patients with MS.

[32] "Neurodegenerative diseases represent, nowadays, one of the main causes of death in the industrialized country. They are characterized by a loss of neurons in particular regions of the nervous system. It is believed that this nerve cell loss underlies the subsequent decline in cognitive and motor function that patients experience in these diseases. . . . At present, inflammation, a common denominator among the diverse list of neurodegenerative diseases, has been implicated as a critical mechanism that is responsible for the progressive nature of neurodegeneration. Since, at present, there are few therapies for the wide range of neurodegenerative diseases, scientists are still in search of new therapeutic approaches to the problem. An early contribution of neuroprotective and anti inflammatory strategies for these disorders seems particularly desirable because isolated treatments cannot be effective. In this context, marijuana derivatives have attracted special interest . . . cannabidiol (CBD), which lacks any unwanted psychotropic effect, may represent a very promising agent with the highest prospect for therapeutic use." Cannabidiol: a promising drug for neurodegenerative disorders? http://www.ncbi.nlm.nih.gov/pubmed/19228180.

[33] "Cannabidiol provides long-lasting protection against the deleterious effects of inflammation in a viral model of multiple sclerosis: a role for A2A receptors." http://www.ncbi.nlm.nih.gov/pubmed/23851307.

[34] See S. Walther, et al., "Delta-9-Tetrahydrocannabinol for Nighttime Agitation in Severe Dementia," Psychopharmacology (Berl) 185, no. 4 (2006): 524-8. This open-label pilot study reported, "Compared to baseline, dronabinol led to a reduction in nocturnal motor activity (P=0.028). These findings were corroborated by improvements in Neuropsychiatric Inventory total score (P=0.027) as well as in subscores for agitation, aberrant motor, and nighttime behaviors (P<0.05). No side effects were observed." See also G. Esposito, et al., "The Marijuana Component Cannabidiol Inhibits Beta-Amyloid-Induced Tau Protein Hyperphosphorylation Through Wnt/beta-catenin Pathway Rescue in PC12 Cells," Journal of Molecular Medicine 84, no. 3 (2006):253-8. "Here, we report that cannabidiol inhibits hyperphosphorylation of tau protein in A beta-stimulated PC12 neuronal cells, which is one of the most representative hallmarks in AD. ... These results provide new molecular insight regarding the neuroprotective effect of cannabidiol and suggest its possible role in the pharmacological management of AD, especially in view of its low toxicity in humans."

pathway for this neuroprotection."[35] It should be noted that scientists do not yet understand what causes Alzheimer's disease itself,[36] which explains why they do not fully understand how cannabis helps treat it.

E. Post-Traumatic Stress Disorder

Post-traumatic stress disorder (PTSD) involves a person developing characteristics symptoms — such as flashbacks, numbing, and avoidance — after personally experiencing an extremely traumatic stressor. It is all too frequently experienced by our returning veterans. Available treatments are often not effective, are dangerous and addictive, and have very severe side effects. There is currently a clinical trial being conducted on whole-plant cannabis to treat PTSD in veterans in the United States after years of fighting to get federal approval.[37]

Other studies suggest that cannabinoids may be an effective treatment,[38] and the experience in New Mexico, where many of the states' medical cannabis patients use it to treat their PTSD, has demonstrated success.[39] PTSD is included in most states' medical cannabis programs. For example, Gov. Chris Christie recently signed a bill adding it to the list of qualifying conditions in New Jersey, specifically citing the need to help returning veterans.

IV. Conclusion

Kansas patients deserve access to any form of treatment that can help them, and CBD-rich cannabis has transformed lives and shown genuine promise for countless individuals and families in the states that allow access. We hope Kansas will follow lead of many other states by allowing physicians to make recommendations they believe are in the best interests of their patients. Please vote to pass HB 2152.

Sincerely,

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[35] Neuroprotective effect of cannabidiol, a non-psychoactive component from Cannabis sativa, on beta-amyloid-induced toxicity in PC12 cells. See http://www.ncbi.nlm.nih.gov/pubmed/15030397

[36] See https://www.nia.nih.gov/alzheimers/topics/causes

[37] "On November 2, 2015, the protocol for our upcoming study of smoked marijuana for symptoms of PTSD in 76 U.S. military veterans was submitted for approval to the U.S. Drug Enforcement Administration (DEA). This is the final approval needed for the study before we initiate the study and prepare for participant recruitment. Participants will be U.S. veterans, men or women, aged 18 or older with a diagnosis of PTSD that has not improved after trying either medication or psychotherapy." http://www.maps.org/research/mmj/mmj-news/5882-medical-marijuana-for-ptsd-protocol-submitted-to-dea

[38] For example: Torsten Passie, et al., "Mitigation of post-traumatic stress symptom by Cannabis resin: A review of the clinical and neurobiological evidence," Drug Testing and Analysis (2012): 649-659; and Eti Ganon-Elaza and Irit Akirav, "Cannabinoids Prevent the Development of Behavioral and Endocrine Alterations in a Rat Model of Intense Stress," Neuropsychopharmacology (2012): 456–466.

[39] George R. Greer M.D., Charles S. Grob M.D. & Adam L. Halberstadt Ph.D.(2014). "PTSD Symptom Reports of Patients Evaluated for the New Mexico Medical Cannabis Program," Journal of Psychoactive Drugs 46(1): 73-77. In 2011, 34% of patients participating in New Mexico's medical cannabis program were diagnosed with PTSD. Authors evaluated patients based on the Clinician-Administered PTSD Score (CAPS). The results showed a statistically significant decline in the CAPS scores for patients using cannabis across all major categories in the CAPS evaluation. Based on these conclusions, the authors showed that cannabis is associated with a reduction in PTSD symptoms for some patients and supported a placebo-controlled study for further research.