EDITORIAL

Medical cannabis

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Aggarwal, et al. have presented in this issue of the *Journal of Opioid Management* an epidemiological survey accomplished via a retrospective chart review of 139 adult patients with chronic pain accessing treatment with medical cannabis.[1] This manuscript is timely and important since there is an expanding body of both laboratory and clinical literature often supporting the efficacy of cannabis in mitigating pain even in patients with neuropathic pain.[2,3] Medical cannabis programs now exist in 13 States in the United States and these authors report that numbers of authorized medical cannabis users in the State of Washington are in the 20,000 range. A recent survey in Canada has shown that 10 perfect of patients with chronic non-cancer pain currently used cannabis for pain relief.[4] With such a large number of users of medical cannabis, there is a concerning but not unexpected paucity of data enabling a risk-benefit analysis not only for providers wishing to facilitate an informed decision by their patients but for patients suffering from intractable chronic pain.

Proponents of medical cannabis, including Aggarwal et al.[1] cite its safety but there are clearly uncertainties of safety, composition and dosage. In France the Department of Health has advised cannabis smokers of the respiratory risk associated with the common practice of adding glass beads or sand to cannabis in order to increase its weight by sellers.[5] Cannabis has been linked in a dose-dependant manner with elevate rates of myocardial infarction and cardiac arrhythmias. It has been implicated in the occurrence of depression, anxiety, psychosis, bipolar disorder, and an amotivational state. It has teratogenic effects on the developing perinatal brain, is associated with chronic bronchitis, reduced lung density, lung cysts and has been linked to cancers at eight sites.[6] The evidence supporting all of these risks is controversial. The actual risk of their association with cannabis use may be proven or disproven. It may be possible to diminish risk such as the possible carcinogenic and respiratory risk by using vaporizers. There is importantly evidence of abuse, misuse, and addiction now supported by fMRI findings.[7]

While there is some high quality data addressing efficacy, there is little high quality data describing safety and many important questions remain unresolved. State medical cannabis laws bypass the usual FDA drug approval process which may include small animal testing, large animal testing, human toxicity studies, dose response studies and efficacy and side effect studies and jump directly to post-marketing surveillance studies. Ideally, the analgesic constituents of inhaled cannabis will ultimately be identified; the proper sequence of new drug assessment can be followed; and, the active analgesic ingredient(s) can be administered like any other drug. While awaiting these developments, many patients who might benefit from the use of inhaled cannabis will suffer intractable pain. Patients and their caregivers with specified medical conditions are, and many believe appropriately, being given exemptions from criminal prosecution to obtain or grow cannabis for their own use, at their own risk. Others believe that advocacy is a poor substitute for scientific analysis.[8]

Evidence based guidelines do not exist to guide practitioners in the use of medical cannabis. Guidelines for the use of opioids address risks and benefits, risk stratification, dosage, use when driving, use in pregnancy, monitoring, and a variety of other issues that pertain to the use of medical marijuana.[9] Despite a dearth of quality studies, it is still possible to make recommendations regarding the use of medical cannabis based on existing evidence and expert opinion.

The study by Aggarwal et al. has several limitations. The apparent disregard of the cognitive, psychomotor, and "high" (euphoria) or dysphoria associated with cannabis use; the scientific validity of the survey instrument; what may appear as a strong bias of the authors towards medical cannabis in the

manuscript and especially; the lack of support for conclusions reached by the authors. Aggarwal et al.[1] opine that their data helps to "deconstruct mythologies about the kinds of patients accessing medical cannabis including their young age or their propensity to malinger or feign disease". This statement is not clearly supported by the material presented in this manuscript. Aggarwal et al.[1] cite similarity of medical cannabis use to opioid use for chronic pain. They present a heterogeneous population of chronic pain patients that likely includes patients abusing, misusing, addicted to, and or diverting cannabis similar to an opioid prescribed chronic pain population. To assume this is not the case is to repeat the same errors made when initially using opioids to treat chronic pain. Risk stratification, careful assessment of pain relief, function, compliance and mood are essential elements of a medical cannabis care model.

Society has placed the burden of deciding who is an appropriate candidate for the use of a nonstandardized drug, with unproven efficacy, unknown safety concerns, and without rational guidelines on clinical providers. Aggarwal et al.[1] have helped by providing a snapshot of a clinical practice of chronic pain patients using cannabis and reporting pain relief and lack of side effects. This is an excellent starting point for further research. Clinical practice guidelines for the use of medical cannabis in patients with chronic pain should be a priority for States with medical cannabis programs.

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ORIGINAL ARTICLE

Characteristics of patients with chronic pain accessing treatment with medical cannabis in Washington State

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ABSTRACT

Objectives: *This study was conducted to better understand the characteristics of chronic pain patients seeking treatment with medicinal cannabis (MC).*

Design: *Retrospective chart reviews of 139 patients (87 males, median age 47 years; 52 females, median age 48 years); all were legally qualified for MC use in Washington State.*

Setting: *Regional pain clinic staffed by university faculty.*

Participants: *Inclusion criteria: age 18 years and older; having legally accessed MC treatment, with valid documentation in their medical records. All data were de-identified.*

Main Outcome Measures: *Records were scored for multiple indicators, including time since initial MC authorization, qualifying condition(s), McGill Pain score, functional status, use of other analgesic modalities, including opioids, and patterns of use over time.*

Results: *Of 139 patients, 15 (11 percent) had prior authorizations for MC before seeking care in this clinic. The sample contained 236.4 patient-years of authorized MC use. Time of authorized use ranged from 11 days to 8.31 years (median of 1.12 years). Most patients were male (63 percent) yet female patients averaged 0.18 years longer authorized use. There were no other gender-specific trends or factors. Most patients (n = 123, 88 percent) had more than one pain syndrome present. Myofascial pain syndrome was the most common diagnosis (n = 114, 82 percent), followed by neuropathic pain (n = 89, 64 percent), discogenic back pain (n = 72, 51.7 percent), and osteoarthritis (n = 37, 26.6 percent). Other diagnoses included diabetic neuropathy, central pain syndrome, phantom pain, spinal cord injury, fibromyalgia, rheumatoid arthritis, HIV neuropathy, visceral pain, and malignant pain. In 51 (37 percent) patients, there were documented instances of major hurdles related to accessing MC, including prior physicians unwilling to authorize use, legal problems related to MC use, and difficulties in finding an affordable and consistent supply of MC.*

Conclusions: *Data indicate that males and females access MC at approximately the same rate, with similar median authorization times. Although the majority of patient records documented significant symptom alleviation with MC, major treatment access and delivery barriers remain.*

Key words: cannabis, marijuana, cannabinoids, chronic pain, opioids, opiates

INTRODUCTION

Recently, there has been widening interest in the viability of the medicinal use of cannabis or marijuana, with a call for further research from The National Institutes of Health (NIH),[1] a statement of support for consideration of the reclassification of cannabis' status as a Schedule I substance by the American College of Physicians (ACP),[2] and a recommendation for clinical use of medical cannabis (MC) for symptom relief in seriously ill patients in limited and locally implemented peer-reviewed

treatment trials in a decade-old report by the Institute of Medicine (IOM).[3] The discovery of an endogenous cannabinoid system with specific receptors and ligands two decades ago has increased our understanding of the actions of exogenous cannabinoids found in cannabis on the human body.[4-6] The endocannabinoid system, which includes cannabinoid receptors, endogenous ligands, and other regulatory molecules, appears to be intricately involved in normal human physiology, specifically in the control of movement, pain, memory and appetite, mood, and inflammation, among other functions.[4,5] An understanding of the biological basis of cannabinoid signaling gives the pain specialist a way to explain why the analgesic effects of cannabis and cannabinoids have been substantiated in a number of studies, including randomized, controlled trials.[7-21]

Indeed, cannabinoids have been found to have analgesic effects "in virtually every experimental pain paradigm."[22] From a clinical drug therapy management standpoint, based on available extensive literature reviews, there is no risk of lethal overdose with MC use, the most frequently reported side effect in the published clinical trials data being mild euphoria.[23,24] Additionally, MC dosing guidelines have also been put forward by clinicians, focusing on the principles of 'start low and go slow' and patient auto-titration.[25,26] The recommendation that patients who wish to use MC be counseled to use oral ingestion or a vaporizer to avoid any health hazards of smoking has also been published.[27]

There exists a population of chronic pain patients who are already on or have already tried opioids but wish to be treated with MC. This will become an increasingly important issue for pain management physicians to address because, as of the writing of this article, 13 states in the United States have functional MC programs, which legally protect physicians who wish to recommend MC from state or federal sanction,[27,28] and several more states are seriously considering adoption of MC laws. Despite growing interest in cannabinoid medicine, little health and life quality documentation exists in the modern literature on US patients who receive authorizations to use MC from licensed physicians in accordance with state laws to treat chronic pain and illness. Four of the 13 active state MC programs—Oregon, Nevada, Colorado, and Rhode Island—have taken efforts to Web-publish health statistics collected from their state registries that describe their MC-using patient populations. In Washington State, where authorized MC-using patients number in the 20,000 range,[25] they have not been studied at all; in California, where an officially recognized MC patient population has existed for 13 years, a small handful of observational studies, all in the San Francisco Bay Area, have been published.[29-31] The studies can be divided into two groups: access-based and delivery-based. MC access-based studies are conducted at point of medical authorization and involve patient interviews, chart reviews, and treatment monitoring, and MC delivery-based studies are conducted at sites where patients are physically delivered treatment with MC and generally involve directed or randomized patient sampling and administration of survey instruments. As the focus of this article is on MC access-based studies in the United States, the peer-reviewed literature in this area will be briefly reviewed. Currently, it consists of only three studies. First, Gieringer (2001)[29] reported data from a 2,480 patient panel treated by the late Tod Mikuriya, MD (1933-2007), a psychiatrist and widely published cannabinoid botanical medicine specialist. Mikuriya recorded more than 250 separate indications for MC under the *International Classification of Disease* Ninth Revision (ICD-9) system in these patients. One hundred percent of the patients had chronic conditions. On the basis of primary ICD-9 diagnosis, the largest category of patients interviewed by Mikuriya (1,133 patients, 45.7 percent) used MC for analgesia to treat conditions such as migraines and neuralgias, arthritis, musculoskeletal injuries, and degenerative disorders. The second largest category (660 patients, 26.6 percent) included patients who used MC to treat mood disorders, such as post-traumatic stress disorder, depression, bipolar disorder, and schizophrenia. The third largest category of patients (136 patients, 5.5 percent) used MC as a harm reduction substitute for problematic substance use, such as alcohol dependency (118 patients), opioid dependency (8 patients), and other substance dependencies (10 patients). Second, Sylvestre et al. (2006)[30] reported in a prospective observational study that MC use improved retention and virological outcomes in patients who received standard interferon and ribavirin treatment for hepatitis C virus (HCV) at Organization to Achieve Solutions in Substance-Abuse (OASIS), a community-based nonprofit clinic providing medical and psychiatric treatment to recovering problematic substance users in Oakland, CA. The interferon/ribavirin treatment

regimen is well-known for inducing painful and debilitating side effects, including fever, chills, muscle and joint aches, fatigue, headache, nausea, and depression. The study recruited 71 HCV+ recovering problematic substance users, of whom 22 (31 percent) used cannabis and 49 (69 percent) did not. The authors noted that the cannabis used by patients in the study "was often obtained with outside medical approval through local 'cannabis clubs'" (1,058). They showed that the cannabis-using group of treated patients were significantly more likely to remain on curative HCV treatment for at least 80 percent of the projected treatment duration (95 percent of cannabis users versus 67 percent of nonusers) and were three times more likely (54 percent of cannabis users versus 18 percent of nonusers) to be classified as sustained virological responders (no detectable virus 6 months after the end of treatment). Finally, O'Connell et al. (2007)[31] reported on the demographics, social characteristics, and patterns of cannabis and other drug use in 4,117 patients seeking access to MC at a thoracic surgeon's private practice in the San Francisco, California Bay Area during the period 2001-2007 based on data gathered from structured clinical interviews. Seventy-seven percent of the MC patients were male, 69 percent were Caucasian, and their median age was 32 years. Nearly all were already established cannabis users who self-medicated for a "mix of physical and emotional symptoms" (p. 5). Investigators found that, in this patient panel, once patients had established cannabis as their substance of choice, subsequent consumption of alcohol, and to a lesser degree, tobacco, diminished (p. 4). As a whole, these three MC access-based studies in California documented MC use in patients with chronic pain, patients undergoing poorly tolerated curative treatments, and patients with histories of problematic substance use.

To better understand the medical geography of MC access in Washington State, the present study was conducted to document MC utilization at a regional pain clinic. The present study is similar to the previous studies published on the Mikuryia, OASIS, and O'Connell patient panels in that it presents a comprehensive report and analysis of the total population of patients being managed with MC at a particular clinic. However, it differs from previous studies in that the patient panel presented here is unique population of patients—namely, those with chronic pain who present mainly via referral to a subspecialty pain management clinic who have been authorized to use cannabinoid botanicals as part of their pain management regimen. The purpose of this study was ultimately to gain a better understanding of the characteristics of this patient population, including factors such as gender, age, reasons for seeking treatment, diagnoses, levels of functionality, and how the use of MC impacted the use of other medications, including opioids.

STUDY DESIGN AND PROCEDURES

The study was sited at a regional pain clinic staffed by University of Washington (UW) faculty. One of the authors (GTC) provides access to MC treatment, information, and management to qualifying patients at this clinic. In conducting this study, the investigators acted as agents of the UW, and the chief administrator of the regional medical center with which the clinic is affiliated signed a letter of cooperation transferring study oversight responsibilities from the hospital institution to the UW IRB. Only 19 researchers in the United States have the necessary licenses to conduct research with cannabis supplied by federal agencies,[32] and of these, only two licensees have a currently active clinical research study. In this study, MC was not supplied to qualifying patients; patients only received medical authorization to engage in the use of MC use at the clinic, which they ultimately procured from various state-approved channels. The study was approved by the UW Human Subjects Division, Application No. 33067, with an approved Waiver of Health Insurance Portability and Accountability Act (HIPAA) Authorization, and a federal Certificate of Confidentiality (NCCAM 08-02) was issued by the NIH's National Center for Complementary and Alternative Medicine.

The study was conducted in 2007-2008 and based at a purposefully chosen office-based physical medicine and rehabilitation, neurology, and pain medicine outpatient clinical practice and referral site in southwest Washington State, where a proportion of patients are undergoing authorized MC treatment under the care of a state-licensed physician and UW faculty member. Retrospective chart reviews of the complete population of MC-using patients at this clinic were conducted, focusing on issues related to chronic pain management and functionality. All clinical data collected from charts were de-identified; patients' home zip codes were used to determine geographic areas from which patients traveled to

access treatment (using the initial three digits of a zip code if the geographic unit formed by combining all zip Codes with the same three initial digits contains more than 20,000 people). A code number was assigned and tagged to each chart and any information that linked the code numbers with the identities of the patients was held in confidence by the medical practice.

The study began by separating out the charts of all patients at the clinic, ages 18 and older, who have access to MC treatment through valid documentation provided by treating physicians included in their medical records. These were the only inclusion criteria. Any patient who may have been also taking the cannabinoid receptor type 1 blocker drug rimonabant, first marketed by the pharmaceutical company Sanofi-Aventis and available from international sources, would be excluded. Medical records were scored for health indicators such as time since first MC authorization, qualifying condition(s), McGill Pain score records, functionality, chronic pain management, opioid and other pain medication usage and change over time, and screened for any issues related to MC cannabis access (previous barriers, referrals from physicians unwilling to provide documentation, etc). See Figure 1 for the official study chart review data collection form. All diagnostic data collected from charts was verified by one of the authors (GTC), who serves as the medical director of this clinic and is fellowship-trained in pain medicine.

UNIVERSITY OF WASHINGTON
Chart Review Data Collection Form
"Cannabinoid Medical Geography in Washington State: Health Access in a Convenience Sample"

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Age _____ Gender _____ Ethnicity _____ ZIP ____

Time since first medical marijuana authorization:

Qualifying condition(s), and brief history of present illnesses (subjective vs. objective findings):

McGill Pain score records over time:

Functionality over time:

Chronic pain management over time:

Opioid and other pain medication usage and change over time:

Any issues related to medical marijuana documentation access (previous barriers, referrals from physicians unwilling to provide documentation, etc.):

Figure 1. Chart review data collection form. Additional pages attached as needed.

RESULTS

Diagnostic and treatment characteristics

One hundred thirty-nine patients' medical charts with valid documentation for their authorized MC use were identified, assigned a code number, 1 through 139, in random order, and reviewed. No patients were excluded due to concomitant use of a cannabinoid receptor-blocking drug. In many cases, medically relevant corroborating information supporting patients' diagnoses, such as such as mechanisms of injury, findings from imaging studies, surgical histories, and other etiological data, were collected in the chart review and summarized (see Appendix).

Demographic characteristics

The group consisted of 87 (63 percent) males with a median age of 47 years and 52 (37 percent) females with a median age of 48 years. Males ranged in age from 18 to 69 years old, and females ranged in age from 22 to 84 years old. Very little data on ethnicity were available.

Geographic characteristics

The MC-using patient population had home addresses that were predominantly (71.9 percent) in the same three-digit zip code area as the clinic site. Fewer and fewer patients from increasingly more distant three-digit zip code areas accessed MC treatment at the pain clinic. See Figure 2 for a map of patient home three-digit zip codes demonstrating distance-decay in estimated travel-to-clinic distances in this patient sample.

MC treatment duration characteristics

While all 139 patients had authorizations for the use of MC from this clinic, 15 patients (10.8 percent) had documentation of prior MC authorization from outside physicians also included in their medical records. In total, the sample contained 236.4 patient-years of authorized MC use, with one of the authors (GTC) serving as the primary authorizing physician for 225.4 (95.3 percent) of these patient-years. Patients ranged in authorization lengths from 11 days to 8.31 years. The median number of GTC—authorized patient-years

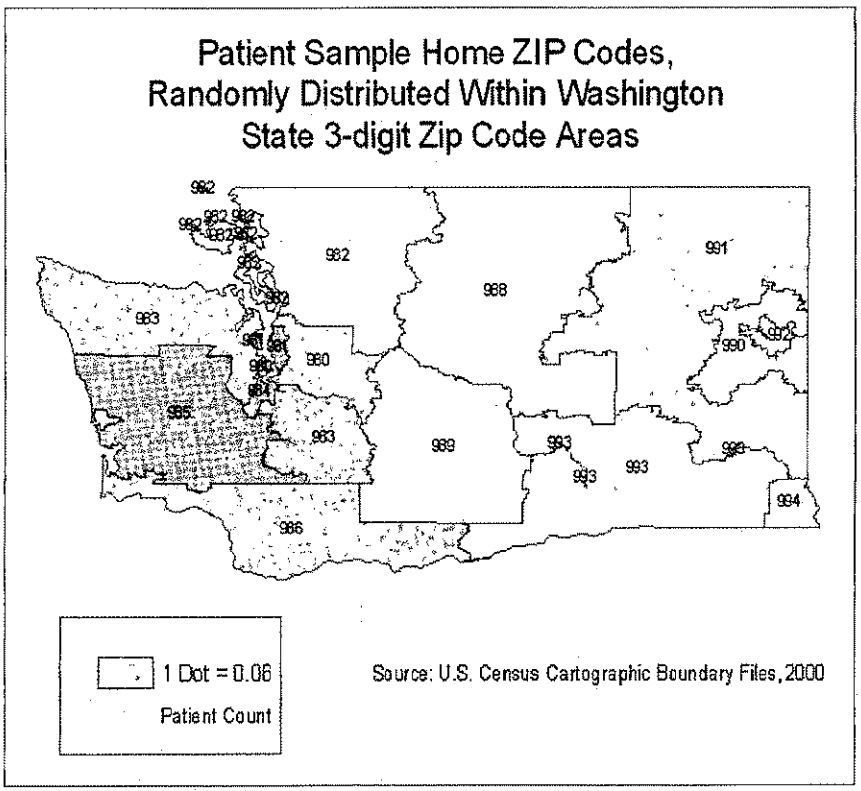

Figure 2. Map of patient home three-digit zip codes. This map was generated by utilizing the first three digits of patients' home zip code addresses to generate 138/0.06 = 2,300 dots, which were then spatially randomly distributed within each of their respective three-digit zip code boundary regions. One patient's home zip code was in IL and is not shown here.

in the sample was 1.12 years. Sixty percent of the GTC—authorized patient-years in the sample were in male patients, but female patients had on an average 0.18 years (~2 months) greater of authorized MC use than male patients.

Chronic pain characteristics

Using diagnostic and medical historical chart data, chronic pain documented in each MC-using patient was classified according to its syndromic nature and type. The following classes were used: Myofascial Pain Syndrome (MPS), Diabetic Neuropathy (DN), Neuropathic Pain Syndrome (NPS), Central Pain Syndrome (CPS), Phantom Pain (PP), Spinal Cord Injury (SCI), Fibromyalgia Syndrome (FMS), Osteoarthritis (OA), Rheumatoid Arthritis (RA), Discogenic Back Pain (DP), HIV Neuropathy (HIV), Visceral Pain (VP), and Malignant Pain (MP). This classification scheme is based on chronic pain etiology and is drawn primarily from a recent classification scheme advanced by pain management researchers Ramamurthy et al.[33] Results are shown in the Appendix. Most patients (n = 123, 88 percent) had more than one chronic pain syndrome or type present.

With regards to the distribution of chronic pain syndromes diagnosed in the patient population, myofascial pain syndromes were the most common (n = 114, 82 percent), followed by neuropathic pain syndromes (n = 89, 64 percent), discogenic back pain (n = 72, 51.7 percent), and osteoarthritic pain (n = 37, 26.6 percent). Central pain syndromes were present in 32 patients (23 percent), fibromyalgia pain in 19 patients (14 percent), visceral pain in 14 patients (10 percent), spinal cord injury pain in 8 patients (6 percent), rheumatoid arthritis pain in 6 patients (4 percent), diabetic neuropathic pain in 5 patients (4 percent), malignant pain in 5 patients (4 percent), phantom pain in 1 patient (1 percent), and HIV neuropathic pain in 1 patient (1 percent).

Characteristic access and delivery hurdles

Although patient records frequently documented significant symptom alleviation with MC and improved tolerance compared to other pain medications, the medical records of 37 percent of the patients in the sample (n = 51) had documented instances of major hurdles related to accessing MC, such as: prior physicians unwilling to authorize use, legal problems related to MC use, and difficulties in finding an affordable and consistent supply of medicine. Although not all legal issues are detailed, the specific legal problems documented in the charts all stem from charges of possession, cultivation, or use of cannabis. In some cases, patients had prior MC authorizations which were not honored by authorities, and in other cases, patients had no MC authorizations in place prior to their legal problems but had previously been unable to find physicians willing to approve of this treatment modality.

DISCUSSION

The 139 patients accessing MC treatment for chronic pain at the study clinic in rural Washington State were a group of severely ill patients with extensive injurious and pathogenic exposures, including 14 with traumatic brain and closed head injuries, nine with HCV, four with past history of gunshot wounds (one in the head), three with past history of shrapnel wounds, five with spinal cord injuries, one with amyotrophic lateral sclerosis (ALS), one with primary lateral sclerosis (PLS), one with myotonia congenita, one with HIV, and 19 with fibromylagia syndrome.

There was a predominance of males (63 percent) in the clinic's patient population who were accessing treatment with MC, a trend seen in all prior published demographic data on the American MC-using patient population studied at access[29-31] and delivery sites.[34-39] The reason for the predominance of males using MC is not clear, although there are many possibilities. Males are known to suffer more traumatic injuries resulting in chronic pain, which is reflective in our study population. Further, male patients may be willing to take greater risk with accessing a recently legalized treatment that still has considerable social stigma, with potential for criminal sanction, still attached. Other gender-specific factors could also be at play. Nonetheless, the male and female median ages did not significantly differ. Data also indicate that males and females are accessing MC at equal rates, given the similarity in median authorization times in males and females.

Geographically, most patients came from the 983 and 985 zip codes, which cover the following counties in Western Washington: Lewis, Thurston, Grays Harbor, Pacific, Mason, and Pierce. The spa-

tial patterning in the geographic data highlights the regionality of MC access in the sample, whereby patients using MC originate predominantly from the areas surrounding the clinic rather than just from any part of the state, regardless of distance. Although the pain clinic is in a rural setting, it is a subspecialty referral site, and thus patients who are referred there for consultation and pain management often have not received satisfactory symptom control in primary care settings. A review of chart notes in their medical records shows that these patients on follow-up or in initial self-reports frequently received satisfactory treatment of their refractory pain conditions with MC. This is seen, for example, in the following chart notes from four patients (quotations taken verbatim from medical records found in the Appendix). **Patient #101**: "He has been using marijuana on his own, as he feels [it] gives him the best pain relief of anything that he has used." 2-3 inhalations on a MJ cigarette 2-3[x]/day, & this improves his pain levels drastically w/o incapacitating him.; **Patient #7**: "using MJ successfully on a daily basis; pain from 8-9/10–>2-3/10; needs only ~2-3 inhalations from a MJ cigarette to get pain relief"; **Patient #38**: "marijuana daily with no SE; "only thing she is now currently using for pain"; **Patient #67**: "She has been using cannabis in the past and has had excellent results with respect to her migraine headaches. Using <1/4 oz/week". Moreover, there was no documentation in any of the medical records of patient cessation of MC use due to intolerance or any other medical reason.

A standard classification system for chronic pain diagnoses was used to describe the patient sample. Most patients (n = 123, 88 percent) had more than one chronic pain syndrome or type present. Male patients had slightly more chronic pain syndromes (mean of 2.9) when compared with females (mean of 2.8), but it is not possible to determine if this difference is statistically significant as these are not randomly drawn samples of all MC-using chronic pain patients in Washington State. There does not appear to be any clear correlation between age and number of chronic pain diagnoses in this patient sample, as patients with 1, 2, 3, or 4 chronic pain syndromes are represented at all decades of life. However, it can be seen that no patient over the age of 65 had just one chronic pain syndrome present. The data indicate that myofascial pain syndromes were the most common in this study population, followed by neuropathic pain syndromes, discogenic back pain, and osteoarthritic pain. These syndromes often involve inflammatory pathophysiological mechanisms, and their treatment with cannabinoid botanicals is consistent with the known analgesic and anti-inflammatory pharmacological effects of cannabinoid medicines.[10,40,41]

The data show that cannabinoid botanicals are being used to treat multiple pain syndromes in the same patient. Although patients presenting with chronic pain syndromes of multiple etiologies might raise the possibility that some of these poly-pain patients have somatoform disorders, the objective historical data found in their charts helps to substantiate the diagnoses of true chronic pain syndromes, rather than simply psychiatric illnesses manifesting as poly-pain. For example, if a patient has lumbar radiculopathy from discopathy in addition to multijoint degenerative osteoarthritis, this patient may well be suffering from three types of chronic pain syndromes: neuropathic, discogenic, and osteoarthritic. Even if there is a somatoform or psychiatric component to some patients' chronic pain, it is worth noting that MC can be used to treat some forms of psychiatric illness.[42] This includes the treatment of depression, which can have a significant mitigating effect on pain perception.[42] Cannabidiol (CBD), a biologically active component of cannabis present to varying degrees in cannabis strains, has been shown in signal transduction studies to act as an agonist with modest affinity at human 5-HT1a receptors.[43] Thus, CBD has useful potential in treating the depression that often accompanies chronic pain.[44]

It is clear from the chart review data presented in the Appendix that many patients had also used or were currently using other non-cannabinoid analgesics in the course of their treatment at the pain clinic or at clinics they have previously visited. In the recorded clinical encounter chart notes, a frequently observed issue is that these previously or concomitantly used non-cannabinoid analgesic medications often had bothersome or intolerable side effects for these patients. The common opioid-related side effects such as constipation, nausea, reduced appetite, sedation, altered mental status, pruritis, and headaches are repeatedly documented. In the section of the Appendix where MC-specific chart notes are tabulated, 26 patients' charts (19 percent) record medical historical data indicating that MC was better than all other pain medications that they had used in the past

and, in some cases, the only medication that they had found to be effective (see the Appendix chart notes for **Patient #'s 14, 20, 27, 35, 41-42, 48, 51, 52, 75-77, 83, 91, 100-101, 109-110, 114, 122, 124, 126-127, 134,** and **136**). Additionally, the chart review also revealed that many patients used MC adjunctively with opioids and other analgesics such as Selective Serotonin Reuptake Inhibitors (SSRIs) and antiepileptics.

Because of the retrospective, nonquantitative methodology used, it is difficult to make any definitive statements regarding the relationship between opioid and MC use in this patient population. Moreover, chart data on comprehensive medication lists was at times unavailable, not up-to-date, or not detailed enough to discern patients' exact chronological sequence of starting and stopping all their medications. Nonetheless, some patients' charts records clearly note reductions in the dosages of concomitantly used opioids; ie, **Patient #126**: "states openly that he has used marijuana in the past and it has helped his pain substantially. Tolerates it much better than opiates and his use of marijuana has substantially decreased his dependence on opiates"; **Patient #133**: "he is using MC to control his pain with good luck with that. He also uses oxycodone and oxyContin, but he tries to limit this." On the basis of the underlying pharmacology, it is known that cannabinoids provide analgesia via specific, receptor-based mechanisms, independent of the mechanisms of opioids.

More than one-third of the patients in the study sample have had past or ongoing hurdles in accessing or being delivered cannabinoid botanicals for medical use. A MC authorization functions in many ways as an authorization for medical asylum from relevant substance control/drug enforcement policies. However, given the frequent presence of cannabis possession-related legal problems in this patient sample, medical amnesty from relevant state laws for the use of cannabinoid botanicals is imperfect and continues to be occasionally disruptable by law enforcement and other administrative actions, given that the exact letter of Washington State's MC law in its current form only provides an affirmative defense for qualifying patients. Additionally, due to the nonreimbursable cost and general unavailability of delivery systems, medical-grade cannabis is frequently difficult for patients with documented medical needs to obtain.

CONCLUSION: CLINICAL RELEVANCE

By providing a medical geographic patient utilization "snapshot" of 236.4 patient-years of the use of MC at a regional pain clinic, this study provides further insight into the applicability of cannabinoid botanicals in the management of a broad range of refractory chronic pain conditions in adults, from myofascial pain and discogenic back pain to neuropathic pain and central pain syndromes. With physicians employing proper chart documentation of appropriate use, efficacy, and side effects at patient visits, in a manner similar to that used in opioid management of pain, there will hopefully be additional reports in the future on MC use in pain management to add to the clinical database.

Such a literature can grow only if certain stereotypes and myths about MC use are dispelled amongst pain management specialists and their regulators. The results presented here should help to deconstruct mythologies about the kinds of patients accessing MC treatment, including their young age or their propensity to malinger or feign disease. One prominent mythology is that patients who receive treatment with MC are not "truly sick."[45] An examination of the chart review data, which includes both subjective and objective diagnostic data substantiating patients' chronic pain illnesses, helps to deflate this concern. Further, in this sample, there was a relatively even distribution among gender and age, without any significant predominance in younger, male patients. Additionally, by reviewing medical records kept at a pain clinic referral site directed by a physician in academic medicine, this article should help to dispel stereotypes and caricatures about valid and invalid treatment with botanical and non-botanical cannabinoid medicines, as the legal distinctions between the different types of cannabinoid medicines are sites of active cultural contestation. Efforts to influence public opinion about cannabinoid medicines are made by federal law enforcement spokespersons, as seen in the two illustrations in Figure 3 of "Dr. Pot" and "Dr. Pat" that appear on a Drug Enforcement Administration (DEA) prevention Web site targeted toward adolescent education entitled "Rx pot: a prescription for disaster."[46]

Figure 3. Federal efforts at validating purely chemical cannabinoid medicines and invalidating purely botanical cannabinoid medicines. Example of drug prevention education on a DEA Web site[46] targeted towards adolescents. The text that appears on the page is: "There's a lot of hype about so-called "medical" marijuana. Get to the facts-and cut through the haze." And, "The Government has already approved medications to help suffering patients."

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Appendix

CHART REVIEW DATA

Pt #	Gender	Age	ZIP+3	MC Auth. length (yr)	Carter-only MC Auth. length (yr)	Primary diagnoses	Secondary diagnoses (if present)	Chronic pain types assigned in study
1	M	40	986	1.50	1.50	Chronic neuropathic pain secondary to ASIA Class A asymmetric quadriplegia, C7 on Left and T10 on Right		NPS SCI
2	M	58	983	0.32	0.32	Hepatitis C virus, neuropathic pain, chronic neck/back pain	Diffuse osteoarthritis	NPS OA VP
3	F	25	985	1.56	1.02	Chronic coccygeal pain secondary to trauma (stress Fx or chronic subluxation)	Secondary myofascial pain complicated by dysmenorrheal	MPS DP
4	F	48	985	0.42	0.42	Chronic low back pain	Right L5 radiculopathy secondary to synovial cyst	MPS NPS
5	M	50	985	1.24	1.24	Chronic back pain secondary to DJD+DDD throughout L-spine and Hx of C- and L-sprain/strain injury (fell off two-story roof); incr. Radicular pain depending on activity level	Chronic active hepatitis C virus	MPS DP VP
6	M	30	985	1.71	1.71	Severe chronic pain with strong neuropathic component secondary to Hx of Polytrauma with IED shrapnel throughout R side of body	Hyperpathia and allodynia	MPS NPS
7	M	18	985	0.35	0.35	Chronic pain secondary to traumatic brain injury (riding bike and struck by a motor home—was in coma [Glasgow scale 4])	Throbbing temporal headaches	MPS CPS
8	F	35	985	1.62	1.62	Cervical sprain/strain with upper back and neck pain and intermittent cervical radiculopathy	Osteoarthritis and degenerative joint disease	MPS NPS OA DP
9	F	55	986	2.27	2.27	Chronic pain of Fibromyalgia (headaches, joint pain, muscle pain, back pain)	Multiple chemical sensitivity	FMS
10	F	49	985	2.03	2.03	Chronic migraine headaches	Fibromyalgia	CPS FMS
11	M	25	985	0.66	0.87	Chronic neuropathic pain secondary to ASIA Class B paraplegia, spina bifida, Arnold-Chiari type 2 malformation	Hx of 36 surgeries	NPS SCI
12	M	37	985	4.77	4.77	Chronic neuropathic pain secondary to ASIA Class D T12 paraplegia (sledding accident @ Mt. St. Helen's with multiple spinal Fxs)		MPS NPS SCI
13	F	40	985	0.38	0.38	Chronic pain secondary to fibromyalgia (diffuse body pain in the upper back, neck, and lower back; joint stiffness)	IBS, CFS	FMS
14	F	39	985	0.97	0.97	Intractable pain (partly myofascial, partly neuropathic) secondary to systemic lupus erythematosus	Fibromyalgia, IBS	MPS NPS FMS
15	M	52	985	0.66	0.66	Chronic upper back and neck pain secondary to Moderately Severe to Advanced DJD+DDD in C-spine	History of MVA in June 2007—cervical sprain/strain	MPS DP
16	F	49	985	0.33	0.33	Chronic pain secondary to rheumatoid arthritis (pain/inflammation in most joints daily); tried predisone, relafen, solumedrol, enbrel, abatacept, remicade		RA

Pt #	Gender	Age	ZIP+3	MC Auth. length (yr)	Carter-only MC Auth. length (yr)	Primary diagnoses	Secondary diagnoses (if present)	Chronic pain types assigned in study
17	F	53	985	0.88	0.88	Chronic back, neck, and hip pain syndrome secondary to Fibromyalgia, severe osteoarthritis with multiple joint involvement, DJD; DDD t/o spine		FMS OA DP
18	M	59	983	0.25	0.25	Chronic neck and back pain secondary to DJD+DDD in L-spine and degenerative OA in L-hip and suspected widespread DJ arthritis	Diabetic peripheral neuropathy with neuropathic pain	DN NPS OA DP
19	M	36	985	1.02	1.02	Chronic pain syndrome secondary to TBI (myofascial and neurological) with R spastic hemiparesis and severe headaches (struck in back of head w/a sprinkler nozzle while trying to break up a fight on March 23, 1996)	L post. Occ. Lobe depressed skull Fx with mult. Bone fragments going into L. parietal lobe; L craniotomy	MPS CPS
20	M	43	993	1.25	1.25	Chronic neck, back, and leg pain and muscle spasms secondary to DJD+DDD t/o spine (worse in L-); L- and C-spinal stenosis w/peripheral neuropathic pain and myelopathy	Hx of OA; Hx of heavy construction work throughout most of life + truck driving	MPS NPS OA DP
21	M	63	985	2.23	2.23	Chronic L arm, shoulder, and neck pain secondary to Chronic L C6 radiculopathy status post-ant C diskectomy and fusion; (injury f/lifting 1/2 in thick plateglass for 150 gal aquarium tank on December 15, 1997)	Degenerative changes and moderate foraminal narrowing	MPS NPS DP
22	F	33	985	2.13	2.13	HIV-related peripheral neuropathy; on combivir and viracept (diag'd HIV+ on March 9, 1999; exposure to unprotected sex)	fibromyalgia and Hx of chronic depression	FMS HIV
23	M	54	985	1.87	1.28	Chronic pain secondary to fibromyalgia with chronic daily migraine headaches + intermittent cluster headaches	Hx of entrapment neuropathy in upper extremities	NPS CPS FMS
24	M	22	985	1.80	1.80	Chronic back pain secondary to Hx of spinal compression Fx's at T10-T12, status post surgical fusion (February 23, 2003: snowboarding acc. @ Whitepass; went off a jump, came down on R shoulder with immediate, excruciating pain)		MPS DP
25	M	53	985	0.56	0.56	Chronic headaches for 10-15 years, multifactoral with some component of migrainous pain but also likely myofascial tension headaches (prodromal effects with flashing lights)		MPS CPS
26	M	58	605	0.72	0.72	Significant ongoing spasticity secondary to primary lateral sclerosis (diagnosed in 2002)	Hx of benign intracranial tumor in L temporal lobe, resected (and work history involving nuclear reactor)	NPS CPS
27	F	45	985	0.68	0.68	Chronic low back pain with muscle spasms; likely myofascial in origin	Hx of OA and chronic depression (with family history of mental illness)	MPS OA
28	F	45	985	1.66	1.66	Chronic neuropathic pain and anorexia; upper back and neck pain and L C7 radiculopathy	Hx of Fibromylagia, DJD-DDD t/o spine (works doing physical labor)	MPS NPS FMS DP

Pt #	Gender	Age	ZIP+3	MC Auth. length (yr)	Carter-only MC Auth. length (yr)	Primary diagnoses	Secondary diagnoses (if present)	Chronic pain types assigned in study
29	M	47	985	5.81	5.81	Chronic, intractable lower back pain (initially stemming from a work-related injury that occurred in 1990 while working in bridge construction)		MPS
30	M	41	985	2.58	2.58	Chronic pain secondary to failed back surgery syndrome (13 spinal fusions; 1987 military accident + other later accidents)		MPS NPS SCI DP
31	F	53	985	0.95	0.95	Chronic neck and back pain secondary to fibromyalgia with chronic daily headaches	Hx of trauma to back in Aug 1983 (garage door came off and fell on top of her); leg break in three places in Dec 1983; etc.	MPS FMS
32	F	84	986	2.27	2.27	Chronic neck pain and headaches secondary to MVA 30 yrs ago w/ severe whiplash injury—chronic cervical neck strain, sprain and stiffness; occ. Radicular pain	Cervical DJD	MPS NPS DP
33	M	42	985	1.53	1.53	Chronic mid-low back pain and leg pain; Hx of Lumbar sprain/strain with disk extrusion at L3-L4 producing R L4 radiculopathy; Hx of heavy-duty truck driving, injury on November 27, 2006, rock quarry and autobody work	Diabetic peripheral neuropathy	MPS DN NPS DP
34	M	53	985	2.38	2.38	Chronic pain secondary to bilat. Recurrent carpal tunnel syndrome--continues to have numbness, burning pain (throughout waking period), swelling after surgeries	allodynia and hyperpathia	NPS
35	M	55	985	0.39	0.39	Chronic daily intractable pain secondary to Hx of polytrauma incl. mult. concussions and blunt trauma to back, neck, and head. (10 years ago: struck on back and across legs by a log ~150 ft in length and 1 ft diameter)		MPS
36	M	61	983	1.10	0.18	Chronic myofasical and neuropathic pain and muscle spasms in neck and back secondary to C- and L-spinal stenosis and multi-level DJD+DDD; intermittent radicular pain, numbness, tingling in arm + leg L > R	Hx of asbestosis, Hx of MVA in 2006 with numerous soft tissue and head injuries; Hx of work as longshoreman/truck driver	MPS NPS DP
37	M	53	985	0.35	0.35	Chronic pain secondary to complex hx of mult. Polyorthopedic injuries incl. compound fx's in both legs w/ residual deformities, facial injuries w/ residual defects, closed head injury with residual defects	1979, 1983—motorcycle accidents	MPS CPS
38	F	35	985	2.71	2.71	Chronic pain secondary to severe L ulnar neuropathy (pain and numbness since 1996)—status post surgery	Arthritic/musculoskeletal lower back and hip chronic pain	MPS NPS OA
39	M	37	985	0.41	0.41	Chronic neuropathic pain and Ashworth Grade 3 spasticity secondary to ASIA Class C C7 quadriplegia	Depression	NPS SCI
40	M	64	985	2.02	2.02	Chronic back and neck pain secondary to chronic L C6-7 radiculopathy and DJD+DDD in C-spine	Moderate bilat. peripheral neuropathy of the upper and lower extremities w/ superimposed L carpal tunnel and bilat cubital tunnel syndromes	NPS DP

Pt #	Gender	Age	ZIP+3	MC Auth. length (yr)	Carter-only MC Auth. length (yr)	Primary diagnoses	Secondary diagnoses (if present)	Chronic pain types assigned in study
41	F	60	985	0.42	0.42	Chronic pain syndrome in shoulders (pred. myofascial) secondary to Hx of bilat. Rotator cuff. Tears requiring surgery and underlying DJD and inter-articular dysfunction (hx of caregiving for heavy clients)	Potential for developing frozen shoulder	MPS OA
42	F	45	985	0.47	0.47	Chronic low back pain with peripheral neuropathic pain (L sciatic nerve entrapment)—numbness, tingling, and very cold feeling	Fibromyalgia and hx of bilat carpal tunnel syndrome	MPS NPS FMS
43	M	28	986	2.48	2.48	Chronic muscle cramping secondary to myotonia congenita (Thomsen's Disease) (first seen on March 13, 1997 @ age 17)		MPS
44	M	38	985	2.29	2.13	Chronic neuropathic pain in lower extremities secondary to myalgia paresthetica in the lat. Fem. Cut. Nerve; Hx of two MVA's 1985+1988—residual chronic pain in head and L knee	Chronic thrombophlebitis (recurring DVT's in legs; hypercoagulability— Protein C and Factor V Leiden deficiency)	MPS NPS
45	F	45	983	1.75	1.48	Chronic pain in lower back and hips secondary to HX of DJD+DDD in L-spine and L- decompression in 1999	Chronic migraine headaches with history suggestive of fibromyalgia, but not all criteria met; hx of chronic depression and anxiety	MPS CPS FMS DP
46	M	53	985	1.37	1.37	Chronic neurogenic and myofascial lower back, neck and radicular pain secondary to DJD+DDD t/o spine with Hx of lumbar laminectomy	Osteoarthritis and chronic daily headaches	MPS NPS OA DP
47	M	67	985	1.79	1.79	Severe Chronic lower back pain and intermittent bilat. Lower extremity pain (R>L). C- and L- DJD+DDD and Hx of C- and L- sprain/strain injuries (Hx of truck driver work and industrial accidents)	L spastic hemiparesis and L hemiplegia secondary to thromboischemic infarct in R MCA (stroke)	MPS CPS DP
48	M	43	985	1.12	1.12	Chronic pain secondary to severe polytrauma w/ massive traumatic brain injuries and peripheral orthopedic injuries (cortical blindness)—headaches and L leg pain centered on knee		MPS CPS
49	F	49	983	0.68	0.68	Chronic pain secondary to DJD+DDD in C-spine w/ herniated disk @ C6-7, impinging on C7 nerve root (Hx of injury at work in 2005 when she had a hot, searing pain down her arm)		NPS DP
50	F	40	985	0.80	0.80	Chronic neck and back pain secondary to MVA	Possible osteomyelitis in pelvis	MPS
51	F	63	983	0.55	0.55	Metastatic Breast Cancer (terminal with six mo to live; on hospice. Diag'd in 2000 ER and PR sensitive on biopsy) L side pain 24/7		MP
52	F	22	985	0.78	0.78	Chronic daily myofascial lower back pain with some radiation to legs (numbness + tingling in ant. Lat. Aspects of legs) (Hx of MVA on September 15, 2006 when her Geo was rear-ended by delivery truck)	Hx of Tarlov Cyst in Spine (L4/L5)	MPS NPS
53	F	23	985	1.18	1.18	Chronic Severe myofascial lower back pain w/ underlying DJD+DDD and numerous areas of muscle spasm; Hx of L- sprain/strain	Chronic daily headaches with possible fibromyalgia	MPS FMS DP

53	F	23	985	1.18	1.18	DJD+DDD and [illegible] L- sprain/strain	

Pt #	Gender	Age	ZIP+3	MC Auth. length (yr)	Carter-only MC Auth. length (yr)	Primary diagnoses	Secondary diagnoses (if present)	Chronic pain types assigned in study
54	M	58	983	6.76	6.76	Chronic neck and back pain due to Chronic stable C- myelopathy secondary to C- spinal stenosis; adv. DJD+DDD in C- and L-spine; disc herniation at C6/7 with radiculopathy; Hx of L-decompression and restenosis	Hx of depression, petit mal seizures, joint pain and partially neurogenic bladder	NPS OA DP
55	M	36	986	2.39	1.04	Chronic pain, including radicular pain, in lower back, mid back, hips, L leg, L wrist secondary to crushed L leg in conveyor belt w/ likely injury to the post. Tibial and common peroneal nerves	Hx of DVT in L leg with thrombectomy; mild discogenic degenerative change @ L4-L5 and L5-S1	MPS NPS DP
56	M	26	985	0.18	0.18	Chronic neuropathic pain secondary to ASIA Class C C5 quadriplegia and Ashworth Grade 2 spasticity secondary to GSW on January 23, 2008 (shot at bank)		MPS NPS SCI
57	M	23	980	0.57	0.57	Chronic head pain secondary to extensive craniophryngioma resection w/ gamma-knife (August 13, 2009). Post:CFS w/ chronic headaches and depression; some pain that shoots up in a band-like fashion f/ neck	Cortical blindness	MPS NPS CPS
58	M	65	986	3.38	3.38	ALS (diag'd in 2004)—terminally ill—increasing weakness, pain, dysphagia, dysarthria, gastronomy		NPS
59	F	48	981	5.94	5.94	Chronic neck and back musculoskeletal pain, secondary to DDD greatest at C7-T1 and nerve damages from 4 (three back + one neck) surgeries		MPS NPS DP
60	M	46	985	0.36	0.36	Severe, Chronic, daily lower back, neck, shoulder, bilat hip pain secondary to Hx of post-traumatic syringomyelia in C-spine (12 yrs ago severely injured in sledding accident) and advanced DJD+DDD t/o spine	Hx of bilat shoulder surgeries secondary to rotator cuff injuries; testicular pain	MPS NPS DP
61	M	19	985	3.36	3.36	Chronic neuropathic pain secondary to C-M-T (type II) disease (mutation not yet determined)		NPS
62	F	54	985	4.46	4.46	Chronic neck pain and chronic daily headaches secondary to C- dystonia, C- myleopathy, Adv DJD-DDD in C-spine, Gliosis in Cerebral Cortex (early MS? Fibromyalgia?)	MVA in Jan 2003, bike accident in 1982; HX of CFS, IBS, OA	MPS NPS OA DP
63	M	47	983	0.20	0.20	Chronic neck, low back, and gen. body pain, spasm, intermit. R severe radicular pain,Hx of GSW in 1976. Regained ability to walk post-paralysis. Hx of stenosis @ C5-6, L C6 root impingement, L4-5 lamin.	Incomplete SCI and R brachial plexus injury. Hx of untreated injuries from heavy work while incarcerated	MPS NPS SC IDP
64	F	51	985	1.07	1.07	Chronic bilat. Hip pain secondary to DJD-DDD in L-spine, DJD in hips and early RA and likely OA	Hx of fibromyalgia	FMS OA RA DP
65	F	47	986	2.39	2.39	Chronic neuropathic pain (allodynia and hyperpathia) in L upper extremity secondary to previous mastectomy w/ removal of lymph tissue; myofascial pain in upper back and neck (2003-breast cancer diagnosis)	Chronic lymphedema	MPS NPS MP