Exhibit #18

Iowa Board of Pharmacy
Special Marijuana Review Committee Meeting
Monday, November 17, 2014
1:00 p.m.

Written Submissions

1. Presentation from Sally Gaer
2. Letter from Nancy Suby-Bohn
3. E-mails from Ray Lakers
4. Letter from Jan Price
5. Letter from Angela Brinkman
6. Letter from Louis R. Davidson
7. Cannabis and Cannabis Resin Information Document, World Health Organization, June 16-20, 2014
8. "Cannabis extract can have dramatic effect on brain cancer, says new research," *Science Daily*, November 14, 2014
9. Iowa General Assembly 2014 Committee Briefings, Cannabidiol Implementation Study Committee, September 11, 2014
10. "Legalization of Medical Marijuana and Incidence of Opioid Mortality," *Journal of the American Medical Association (JAMA) Internal Medicine,* published online August 25, 2014
11. "Medical Cannabis Laws and Opioid Analgesic Overdose Mortality in the United States, 1999-2010," *Journal of the American Medical Association (JAMA) Internal Medicine,* published online August 25, 2014
12. "PTSD Symptom Reports of Patients Evaluated for the New Mexico Medical Cannabis Program," *Journal of Psychoactive Drugs*, Volume 46 (1), January-March 2014, pp. 73-77.
13. "Is the Grass Always Greener? An Updated Look at Other State Medical Marijuana Programs," Lance Ching and Johnny Brannon, Legislative Reference Bureau, State Capitol, Honolulu, Hawaii, August 2014.
14. Prepared Remarks of Dale Woolery, Iowa Governor's Office of Drug Control Policy, and three attachments
15. Comments of Ronald A. Herman, Ph.D., College of Pharmacy, University of Iowa
16. Position Statement of Alliance of Coalitions for Change (AC4C)

Presentation for Iowa Board of Pharmacy November 17, 2014

My name is Sally Gaer and I am the mother of a medically fragile 24 year old daughter who suffers from Intractable Epilepsy. She currently takes 4 anticonvulsant medications and has a Vagus Nerve Stimulator. She would be covered under the newly passed Iowa Law, Senate File 2360. Once the rules become effective, January 30, 2015, we will print off an application, take it to her local neurologist, have him mail the form and wait for the form to be processed by the Iowa Department of Health. Upon approval, we will travel to the DOT to have her card processed.

We will basically be unable to access any high CBD, low THC oil anywhere in the United States, so I'm not really sure what we will do with the card.

I urge that the Iowa Board of Pharmacy recommend to the Iowa Legislature and the Governor to remove Medical Marijuana from Schedule 1 to Schedule 2 allowing this plant to be recommended by physicians and studied by the medical community.

I would add it would be extremely beneficial for you to also recommend that a controlled grow, process and laboratory facility be allowed in Iowa to provide this medication to medically fragile Iowans.

There is a bill in Congress, HR 5226, Charlotte's Web Medical Hemp Act of 2014 seeks to remove therapeutic hemp and cannabidiol from the definition of Marihuana and not be treated as a controlled substance so that citizens who need it to help alleviate their suffering from intractable epilepsy are able to gain access. At this time we are not sure if this bill will make it through the current or future Congress.

I have no doubt there is medicinal value in Medical Marijuana, specifically for my daughter, but for many other medically fragile Iowans. Please recommend to the Iowa Legislature the Rescheduling from Schedule 1 to Schedule 2, as the Interim Study committee Recommended on September 11, 2014. They also recommended to develop a regulated program to produce, process, and dispense medical cannabis and further recommended that medical cannabis not be taxed by the state at any stage of producing, processing or dispensing.

Thank you.

312 Corning Ave
Des Moines, IA 50313-4336
November 15, 2014

Iowa Board of Pharmacy
400 SW Eighth Street, Suite E
Des Moines, Iowa 50309-4688

Re: Iowa Board of Pharmacy Teleconference

My name is Nancy Suby-Bohn, and I am a resident of the State of Iowa. As a substitute teacher for the Des Moines Public School and will be on assignment at Harding middle school, I will not be able to attend November 17th Special Meeting: Marijuana Review Committee, but wish for my concerns to be heard by the Iowa Board of Pharmacy.

Personally, I support LOW-THC Medical Marijuana oil for medical use, also known as *Charlotte's Web*, prescribed and dispensed by Iowa Licensed Medical Specialists.

But when it comes to the higher THC used for recreational marijuana, I believe the board needs to hear my story:

On Sunday, June 6th, 2010, my daughter was celebrating graduating North High School at a Open House at Union Park (East Shelter House). The Open House was winding down and clean-up was just about to begin when we heard a "pow" and my nephew said, "Wow, that car just hit that tree."

We turned and watched a jeep drive through the lower level of the park at FULL speed until he came to another tree, hitting it straight-on, with such a force, the jeep "bounced" of the tree and changed directions. Luckily the jeep could go no further.

My husband and brother ran to the jeep to see if the driver (Joel Simpson) needed assistance -- making sure he was not in need of medical assistance (my husband is Red-Cross certified).

As my sister-in-law (Julie Suby) and I followed behind them, Julie heard someone say something and ran in the direction of the three, Joel first hit.

After I doubled check to make sure Joel was o.k.. I noticed he was "out-of-it" but could not smell any alcohol on his breath. I left Joel and went to find Julie to see what was happening.

There, lying in the grass, was a young girl, wearing a blue demine skirt with a white shirt, blood everywhere, Julie holding her head stable as she gurgled and gasped for air to breath, until rescue arrived. The gentleman with her kept saying, "I can't believe he hit her, I can't believe he hit her...."

Her flip-flops marked the place he plowed into her. Not as she crossed the street, but in the grass, several feet from the side of the road and many, many, MANY feet from where she laid.

We didn't know who she was and they could only stabilize her but couldn't administer medical care until they received an adult's consent. She was just a girl, on her way home, from playing at the park. Luckily the group of girls she was playing with decided to also go home and walked by our Open House. With the description we gave them, they were able to identify her as Melissa Robinson and knew where her grandma lived which saved her life.

Joel Simpson was charged with driving under the influence of marijuana and pled guilty. "A shackled Simpson told a judge that he had marijuana in his system when he struck Melissa Ann Robinson in June." (http://blogs.desmoinesregister.com/dmr/index.php/2011/02/09

The girl, Melissa Robinson, "endured surgeries to put plates in her face, insert pins in her right leg and repair a tear in the aortic valve of her heart."
(http://blogs.desmoinesregister.com/dmr/index.php/2011/02/09/)

I tell this story because, not only did I witness it, but my degree is in Civil Engineering. I am not a licensed Engineer, but I learned how to design road and bridges to keep people as safe as feasibly possible, for people driving cars can kill themselves and others.

At one time, "Drinking of spirits" was illegal and later overturned. You might hear this as a case to support the recreational use of recreational marijuana and to show people can be responsible.

Well, Drinking of spirits may be legal to consume, BUT it is still ILLEGAL to get behind the wheel of a vehicle with an alcohol level of 0.08. After SEVERAL people died, due to drunk driving, the law was changing to make 'drinking and driving' illegal; but in order to be able to enforce the law, an on-the-spot test needed to be developed for law agencies to use to determine if the driver was intoxicated 'under the influence' or not. Because the old sobriety test was subject to personal observation and judgment, the breath analyzer test and blood alcohol test were developed to aid in the convictions.

Legalizing of spirits is a perfect example of what will happen if recreational marijuana is legalized. Before the bill/law can be considered, the bill will need to include a standardized system of measuring "how high is too high" to drive and including an accurate on-site testing of how much marijuana is in a person's system. Without it, violators cannot be legally held responsible for causing harm to themselves or others.

It is not up to the Iowa Board of Pharmacy to develop these standards and tests.

If Iowans for Medical Marijuana wishes to have their bill considered, I recommend the group first develop standards and accurate on-site testing in order to hold violators accountable.

With rights come responsibilities.

Thank you for reading,

Nancy Suby-Bohn, CE, FE

Jorgenson, Debbie [IBPE]

From:	Jessen, Lloyd [IBPE]
Sent:	Monday, November 17, 2014 8:01 AM
To:	Jorgenson, Debbie [IBPE]
Subject:	Fwd: I had hoped to attend please submit the following for the record
Categories:	Debbie

To print ...

Lloyd K. Jessen
Executive Director
Iowa Board of Pharmacy
Lloyd.Jessen@iowa.gov
515.729.2466

Begin forwarded message:

From: Ray Lakers <rlfoundation1@aim.com>
Date: November 16, 2014 at 11:27:59 PM CST
To: "Jessen, Lloyd [IBPE]" <Lloyd.Jessen@iowa.gov>
Subject: I had hoped to attend please submit the following for the record

To: Lloyd Jessen and Iowa Board of Pharmacy members

I am not able to make it back from Colorado in time for the hearing tomorrow, November 17, due to weather and travel delays I can only submit my concerns via email.....Over the last five years I at least can give you an update on my health, since you have been always open to my concerns in person and private Lloyd.I know I leave quite an impression, sorry I won't be able to say hello tomorrow. Below is my testimonial.

It was 2/17/2010 when after four public hearings in 2009 when the Board made the right vote.

We, the medical marijuana patients in Iowa or from Iowa, need some relief from the current laws on the books. While everyone is trying to reinvent the wheel, Iowans suffer.

As you know and I have testified numerous times, I take no FDA prescription drugs. My mobility improves with cannabis and I can stand on my feet. Prescription pain relievers are not the solution for many of us with MS who still walk. For those who can't, that may be in a wheelchair, they too might want something alternative to prescription pain relievers, in fact many are using cannabis, just hard for them to come forward, same time many have a hard time finding a quality,reliable cannabis supply.
For some reason they seek me out, I can only help them here in Colorado, and since I have lived here, I have found 20+ Iowans in various parts of Colorado that moved here that I know personally.

Cannabis is safe medicine, save the fear. In order to explore the scientific benefits, we need to take the handcuffs on an innocent plant.

Solution, start a PILOT PROGRAM. Allow a medical defense. Make a list of treatable conditions just like we did in 2009.

As for Terry's Hemp Oil, cannabis oil, Charlotte's Web, cannabadiol.Read this,we,Iowa medical patients also need a judicial review of the bill signed into law last summer. It is oppressive,

prejudicial,makes epileptic children/parents criminals, just like me. Tell me when the first Iowa LEGAL drop of CBD oil arrives via Terry's Hall Pass, so I know someone is getting the health benefits of cannabis.

See below from Georgia.

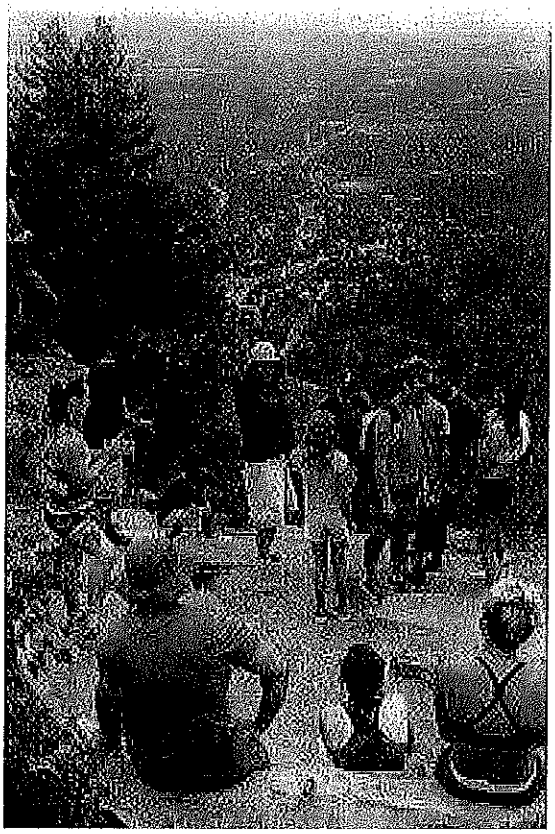
http://www.orlandosentinel.com/news/os-charlottes-web-rules-tossed-out-20141114-story.html

Judge tosses out rules for 'Charlotte's Web' medical pot

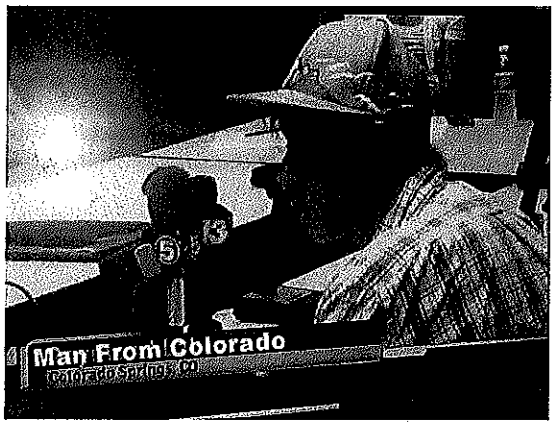
Ray Lakers

Iowa Clemency Project
Colorado Springs, CO

Here is a picture of me reaching the top of the Manitou Incline last August, I'm sure you saw me on the news, I am now "Man From Colorado".



Has MS, smokes marijuana daily, climbed the Manitou Incline


Man From Colorado

Jorgenson, Debbie [IBPE]

From: Jessen, Lloyd [IBPE]
Sent: Monday, November 17, 2014 8:00 AM
To: Jorgenson, Debbie [IBPE]
Subject: Fwd: Additional Facts from Dr. Raphael Mechoulam

Categories: Debbie

To print

Lloyd K. Jessen
Executive Director
Iowa Board of Pharmacy
Lloyd.Jessen@iowa.gov
515.729.2466

Begin forwarded message:

From: Ray Lakers <rlfoundation1@aim.com>
Date: November 16, 2014 at 11:40:10 PM CST
To: "Jessen, Lloyd [IBPE]" <Lloyd.Jessen@iowa.gov>
Subject: Additional Facts from Dr. Raphael Mechoulam

Dr. Raphael Mechoulam, the grandfather of cannabinoid research, is quoted as saying that THC usually doesn't provide the same medical benefit by itself as when in the presence of its lesser-known cousin, CBD. But to Marcu, the entourage effect goes much, much further than that – and he's got the research to prove it.

For Marcu, this pharmacological model explains the fallacy of the legislative fad to legalize only CBD, a compound which has been shown to have medical benefits and supposedly provides no intoxicating effect – a claim at which Marcu scoffs.

"CBD is psychoactive," he said. "It's not like THC, it has a unique and different mechanism, but it does go into the brain and have an effect." But there's an even greater flaw to the thinking underlying "CBD-only" bills: "There is no such thing as CBD-only cannabis," Marcu said. "And if there were, it would not be effective."

http://theleafonline.com/c/activism/2014/03/there-is-no-such-thing-as-cbd-only-cannabis/

The Iowa Board of Pharmacy

I am a 64 year old women living with RLS for 20 years. The last 10 years I have had progressive neuropathy that began in my lower spine and now involves my whole body. It is burning, tingling pain that is getting progressively worse. I take 6 different pain medications including methodone and Hydrocodone. I also use gel ice packs 24/7.

When Governor Branstad finally admitted cannabis oil could help children with epilepsy I hoped there might be ~~hope~~ help for people with chronic progressive pain that doesn't respond to other medications.

Please consider helping people with cancer, MS, ALS, Parkinsons and other medical conditions.

Thank you for your consideration

Jan Price
1530 N.W. Wagner
Ankeny.

Topic:
Medical Marijuana

6920 Mill Pond Drive
Urbandale, Iowa
50322

Ia Board of Pharmacy

The diseases that cause me pain are fibromyalgia, degenerative arthritis and nerve pain caused from a severe lumbar scoliosis. There are 3 medications that may help with nerve pain. I'm unable to take them due to side effects. These medications are also very expensive.

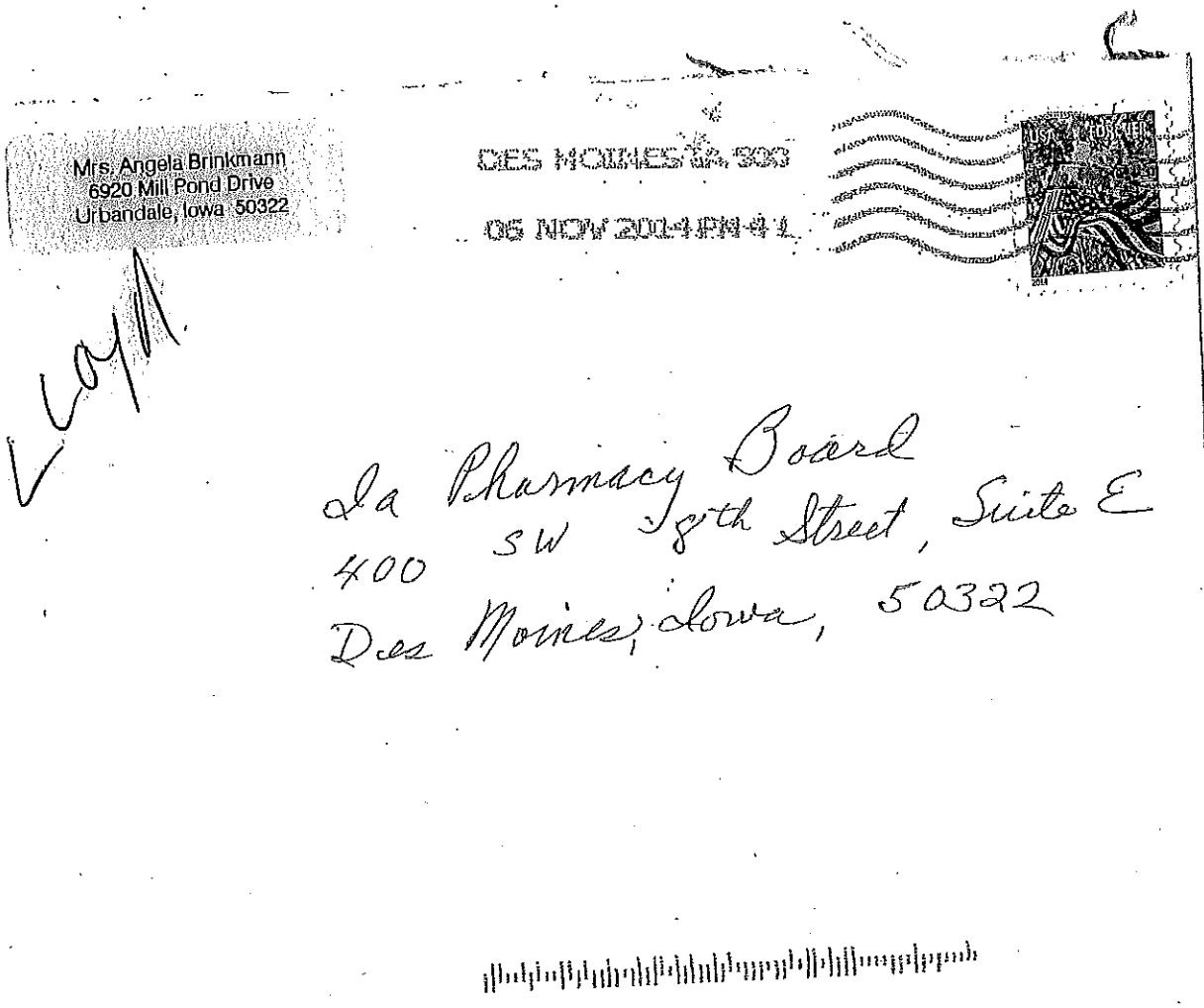
On a recent trip to Colorado I tried some medical marijuana. It was effective at a much lower price than medication. When buying I was asked, "Do you want to get high?" My reply was "No." He recommended a patch, specific for nerve pain and suggested I start with the patch cut in 10 pieces. It was effective and would have been cheaper had I been a Colorado citizen. Because it is illegal to take this patch out of Colorado and to take it into Iowa the pain control was brief.

If you have ever had much severe pain, you know that pain causes depression and affects every part of your life: From relationships, work, recreation, and ability to lead a productive life.

I urge you to move toward allowing medical uses of marijuana at prices and routes that are easily available.

Thank you for considering this issue.

Angela K. Brinkmann



Even Washington, D.C. has voted to approve the use of medical marijuana. Give me a break Legalize same sex marriage in Iowa but demonize marihuana.

It is all a cruel joke!

L.R. Davidson

least and loudmost, were the supporters of Monsanto chemical company and various pharmaceutical companies in the effort to outlaw cannabis. Monsanto had patented Nylon, and wanted hemp removed as competition. The pharmaceutical companies could neither identify nor standardize cannabis doses and besides, with cannabis, folks could grow their own medicine and not have to purchase it from large companies.

On Aug. 2, 1937, marijuana became illegal at the federal level.

It's time to change Iowa's pot laws

Iowa spends millions arresting, having a trial and jailing people for use or possession of marijuana. Colorado saves millions by not doing that and makes millions by taxing the growing and sales of marijuana.

Iowa is a job-creator for drug suppliers. The "War on Drugs" has been a failure, and Harry Anslinger was wrong about marijuana being a stepping-stone drug.

It's time to change.

— *Allan F. Demorest, Des Moines*

Mr. Louis Davidson
1723 Willis Ave
Perry, IA 50220

DES MOINES IA 503

05 NOV 2014 PM 4 L

USA

forever

Pharmacy Board
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D.M., IA.
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Cannabis and cannabis resin

Information Document

Agenda item 8.2

Expert Committee on Drug Dependence

Thirty-sixth Meeting

Geneva, 16-20 June 2014

World Health Organization

This document is provided for the information of the ECDD. It is intended to provide background and relevant information for the use of the ECDD, and the presentation, inclusion or omission of material in it does not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the subject matter of this document. Further, for all matters involving the role and mandate of the ECDD attention is drawn to the *Guidance on the WHO review of psychoactive substances for international control*, adopted by the WHO Executive Board at its 126th session in January 2010, which serves as the basis for this document. In the case of any discrepancies between this document and the *Guidance on the WHO review of psychoactive substances for international control*, the *Guidance on the WHO review of psychoactive substances for international control* prevails.

Contents

Introduction

Cannabis is scheduled in Schedules I and IV of the Single Convention on Narcotic Drugs as amended by the 1972 Protocol (the "Single Convention"). A review of cannabis and cannabis resin by the World Health Organization is necessary for multiple reasons, the foremost being that the medical use of cannabis appears to have increased in recent years. Cannabis and cannabis resin has not been scientifically reviewed by the Expert Committee since the review by the Health Committee of the League of Nations in 1935. An increasing number of countries are adopting varying policies on cannabis and cannabis resin different from prohibition to mitigate the harm due to cannabis. In addition, the Commission on Narcotic Drugs in its Resolution 52/5 from 2009 stated that it looks forward to an updated report on cannabis by the Expert Committee on Drug Dependence . The International Narcotics Control Board, in its annual report for 2013, invited WHO, in view of its mandate under the 1961 Convention, to evaluate the potential medical utility of cannabis and the extent to which cannabis poses dangers to human health.

This document lists a number of aspects to be considered by WHO and the WHO Expert Committee on Drug Dependence (ECDD): they include procedural aspects of such a review; considerations regarding the current level of control ; ECDD assessment requirements (including aspects that need specific attention); and some other considerations such as quality assurance of medicinal cannabis. The purpose of this document is to guide discussions during the 36th meeting of ECDD.

History of the review and control of cannabis and cannabis resin

Cannabis and Cannabis Resin are both scheduled in Schedules I and IV of the Single Convention on Narcotic Drugs since this Convention came into force in December 1964. *(1)* These substances were discussed internationally for drug control because Italy and the United States raised the question of "Indian hemp" (cannabis) at the The Hague Conference of 1912, *(2)* but it was only the second Opium Convention of 1925 that regulated the international trade of "Indian hemp", its resin and its galenic preparations. It allowed for the medical and scientific use of galenic preparations. *(2, 3)*

Cannabis was reviewed by the Health Committee of the League of Nations in 1935, which recommended that preparations obtained from cannabis extract or tincture were placed under control of the second Opium Convention. *(2, 3)*

After World War II, WHO became responsible for the health functions of the League of Nations. The Expert Committee on Drugs Liable to Produce Addiction, later called the Expert Committee on Addiction-Producing Drugs (and today called the ECDD) spoke out against the medical use of cannabis repeatedly (e.g. fifth (1955), 11th (1960), 14th (1965) and 16th Meetings (1968)). *(4,5,6,7)* However, in none of these cases was there a review of the dependence-producing properties of the substance. WHO published a literature review on the physical and mental effects of cannabis in 1955, which was prepared by a former WHO staff member for the Commission on Narcotic Drugs. *(8)* However, it is not clear if this report was discussed by the Expert Committee on Drugs Liable to Produce Addiction, because it is not mentioned or cited in the Expert Committee's reports.

Because of their inclusion in the 1925 Opium Convention, cannabis and cannabis resin were included in Schedule I of the Single Convention on Narcotic Drugs. When the Schedules of the Single Convention were drawn up, the Expert Committee on Addiction-Producing Drugs stated that it "believed that the composition of the schedules [on the draft list for the Single Convention] should be most carefully reviewed before they become an established part of the new Convention". *(9)* However, the Expert Committee's tenth report only mentions that substances in Schedule III were reviewed individually. No reference can be found to a review of cannabis and/or its resin. *(3, 5)* The Expert Committee's 13th Report also mentions a review of substances for the Single Convention, but again, no specific reference to a review of cannabis or cannabis resin is made. *(10)*

The Technical Committee of the Plenipotentiary Conference which negotiated the Single Convention included both substances also in Schedule IV. The Technical Committee used the following criteria for inclusion: Substances "(a) Having strong addiction-producing properties or a liability to abuse not offset by therapeutic advantages which cannot be afforded by some other drug; and/or (b) For which the deletion from general medical practice is desirable because of the risk to public health". *(11)*

After 1968, cannabis does not appear on the agenda of the Expert Committee. Therefore, even if reviews were conducted in the past by WHO, the most recent reviews of cannabis and cannabis resin were conducted when review methods and the knowledge of dependence and substance abuse were less developed than they are today. WHO published a report on the health effects of cannabis in 1997, but this report was not prepared for the purpose of reviewing the scheduling of cannabis and therefore, was not discussed by the Expert Committee on Drug Dependence. *(12)*

In its 2009 Resolution 52/5 "Exploration of all aspects related to the use of cannabis seeds for illicit purposes", the Commission on Narcotics Drugs (CND) requested "the United Nations Office on Drugs and Crime to share information regarding the health risks posed by cannabis with the Expert Committee on Drug Dependence of the World Health Organization, and, in that regard, looks forward to an updated report on cannabis by the Expert Committee, subject to the availability of extrabudgetary resources". *(13)* The 35th Expert Committee on Drug Dependence agreed to review cannabis in a future meeting of the Committee. *(14)* Moreover, an author group consisting of WHO staff, experts and consultants related to WHO's work on substance misuse recommended that substances that not reviewed for a long period of time, should be re-reviewed regularly using modern methods for the purpose of improving the credibility of scheduling. *(3)*

In recent years, many countries developed strategies that acknowledge differences in safety between psychoactive substances. Recently, the use of cannabis for recreational use was legalized in Uruguay and in Colorado and Washington State in the United States of America. *(15, 16)*.

In the last fifteen years, many countries have allowed the medical use of cannabis .Its current scheduling in Schedule IV is based on the assumption that there is little or no therapeutic role for cannabis.

It is against this background that the Secretariat is planning a review of cannabis and cannabis resin. However, because of the complexity of such a review, it was decided not to include a review as such on the agenda of the 36th ECDD, but first to develop this discussion paper on the modalities of such a review.

In this document, considerations for preparing a review of cannabis are discussed. This document will discuss:

- Procedural aspects of the ECDD review of cannabis and cannabis resin
- Aspects of changing the scope of control
  - Scheduling options for the committee
  - Definition
  - Current control of legal production of cannabis for medical and scientific purposes
- Aspects to include in an ECDD assessment
  - Aspects listed in the guidance (19)
  - Among aspects listed in the guidance, aspects that need specific attention
- Aspects related to different properties of various types of cannabis and its resin
- Other Considerations
  - Quality assurance of medicinal cannabis

Procedural aspects of the ECDD review of cannabis and cannabis resin

The WHO review procedure, grounded in considerations of public health and with an evidence-based approach, utilizes the best available relevant information. Consistent with the requirements of the 1961 and 1971 Conventions, WHO develops scheduling recommendations guided by the provisions in the Conventions regarding the changes in the scope of control of substances and also taking into account the preambles of the Conventions, the need to reduce the risk to public health, including the risk of abuse and ensuring medical availability, and the relevant resolutions of its governing bodies. The Conventions are legal instruments; the WHO review procedure is applied in a manner consistent with the letter and the spirit of the Conventions.

The functions of the Expert Committee are to review information available to it on substances being considered for international control and for exemptions, and to advise the Director-General on such control. The advice of the Expert Committee concerns scientific, medical and public health findings and must comply with the criteria established in the Conventions. The Expert Committee is assisted by a secretariat, in particular by the Expert Committee's Secretary and furthermore by staff members from appropriate WHO programmes, consultants and temporary advisers, as required.

The Expert Committee deliberations are facilitated by documents provided by the Secretariat. Proposals for the change in control of a substance should be subjected to the same assessment that is given to substances proposed for initial scheduling. The relevant criteria in this regard are set out in paragraphs 43; 46 to 59 of the *Guidance on the WHO review of psychoactive substances for international control*, adopted by the WHO Executive Board in at its 126th session. The Expert Committee should follow the sequence for analysis established

by the guidelines for all substances that is, first consider applicability of the Single Convention and, if it is not found to apply, then the Convention on Psychotropic Substances of 1971. Further information regarding the assessment process can be found in the *Guidance on the WHO review of psychoactive substances for international control,* particularly in paragraphs 43; 46 to 59 (17)

Aspects related to potentially changing scheduling status

Scheduling options for the Committee

Currently, both Cannabis and Cannabis resin are scheduled on two schedules simultaneously: Schedule I and Schedule IV. Therefore, changes that the Committee can propose are:

a. Removal from Schedule IV, while maintaining it on Schedule I
b. Removal from Schedule IV, and moving it from Schedule I to Schedule II
c. Removal from both Schedule I and IV
d. Combine placing on Schedule I or II with an exemption for certain preparations by placing these preparations on Schedule III

A fifth option for the committee will be not to make change in status. For assessing whether to recommend scheduling and if yes, which schedule to recommend, the Committee should follow the criteria and procedures as provided in the Conventions and further elaborated in the *Guidance on the WHO review of psychoactive substances for international control, (17)* in particular the paragraphs 43; 46 – 59.

Paragraph 6 of Article 3 of the Single Convention clarifies that for drugs already scheduled, the CND may, in accordance with the recommendation of the World Health Organization, amend any of the Schedules by transferring a substance from Schedule I to Schedule II or from Schedule II to Schedule I or deleting a drug or a preparation as the case may be, from a Schedule.

While evaluating cannabis and its resin, the Committee should consider all scheduling options mentioned above

Definition

According to the Convention, cannabis is defined as "the flowering or fruiting tops of the cannabis plant (excluding the seeds and leaves when not accompanied by the tops) from which the resin has not been extracted, by whatever name they may be designated." Cannabis resin means "separated resin, whether crude or purified, obtained from the cannabis plant." These definitions are narrower than the botanical definition and as a consequence, certain parts of the plant are not under international control.

While evaluating cannabis and its resin, the Committee should decide whether the review will be limited only to those parts currently controlled

Current control of legal production of cannabis for medical and scientific purposes

It should be noted that medicinal cannabis is used in a number of countries. Some of these countries cultivate cannabis for domestic medical use: Canada, Israel, the Netherlands, the United Kingdom and a number of states in the United States (see under *Aspects to Assess, (9) Therapeutic applications, extent of therapeutic use and epidemiology of medical use*). Article 28 requires that the country applies the same controls as listed in Article 23, paragraph 2 for the production of opium. The agencies should supervise the cultivation and take possession of the produced cannabis no later than four months after the harvest.

All the countries mentioned here established one or more state agencies as required in Article 28 of the Convention. Entities carrying out the functions of such an agency were also identified by the Governments of Austria and the Czech Republic, but the cultivation has not yet started. In the USA, functions are carried out by NIDA and the DEA, but they are involved with the production for scientific purposes only and not with the production for medical purposes by the states.

Nutt et al. describe the mechanisms of current control that hamper research with cannabis (and other strictly controlled medicines in Schedules I of the Single Convention and the Psychotropic Substances Convention). *(19)*

> *A critical review report for the Committee should contain details of medical use and how this is regulated in different countries, so that the Committee understands the epidemiology of use and regulations to make appropriate decisions.*

Aspects to include in an ECDD Assessment

Aspects listed in the Guidance

For Cannabis assessment, all aspects mentioned in the WHO Guidance (17) need to be followed. Furthermore, based on CND Resolution 52/5 any pertinent information from UNODC and also other relevant sources such as INCB should be considered for the review report, for example the UNODC discussion paper "Cannabis, A short review" *(20)*

Aspects that need specific attention

(5) Toxicology and (6) Adverse reactions in humans

There is no known LD_{50} for cannabis and cannabis resin. For its main active principle dronabinol, the LD_{50} has been shown to be higher than 9000 mg/kg in primates, corresponding to a dose of over 3 kg strong cannabis (~23% THC) in humans. *(21)* The Expert Committee need to examine the ill effects as compared to other substances under control.

(7) Dependence potential (8) Abuse potential

These important criteria for international control need to be evaluated with recent evidence. To understand harm due to cannabis better, it is also important to understand whether lack of availability of cannabis due to control is associated with the increasing use – dependence

and abuse - of potentially more dangerous synthetic cannabinoids and thus the relative harm.

(9) Therapeutic applications, extent of therapeutic use and epidemiology of medical use

Since the last decade of the twentieth century, evidence for medical uses increased considerably (22, 23,24). Indications being considered among others include spasticity, chronic pain and some neuropsychiatric symptoms. In different ways, various countries recognized a role for safe and effective medicinal use of cannabis.

Currently, medical use of cannabis is allowed in a number of countries. In the past 20 years, its (legal) medical consumption has gone up from almost non-existent to 23.7 tonnes in 2011 and 77 tonnes in 2014(25).

The United Kingdom produces cannabis for the production of a dronabinol-cannabidiol combination preparation for the treatment of spasticity due to multiple sclerosis (Sativex®) that is prepared using cannabinoids extracted from plant material[1]. This preparation has been approved as a medicine in 24 countries (including Austria , Australia, Belgium, Canada, the Czech Republic, Finland, Germany, Hungary, Iceland, Italy, the Netherlands, New Zealand, Norway, Poland, Portugal, Slovakia, Spain, Sweden, Switzerland, and the United Kingdom).

(17) Current international controls and their impact; and (18) Current and past national controls

The current international controls are the strictest controls possible under the Conventions: stricter control than that effected through being placed in Schedules I and IV of the Single Convention is not possible. Since the 1970s, some countries have decriminalized, condoned or legalized the possession of cannabis and sometimes also the distribution and production.

> *When the Committee will evaluate cannabis and its resin, it is recommended that it reviews all aspects listed in the Guidance, with special attention to a) its absolute acute toxicity, b) its relative harmfulness compared to other substances under control, c) to the medical use of cannabis, and d) current controls and their impact.*
>
> *The Secretariat, while preparing a critical review report, should ensure that this report entails sufficient documentation on all aspects listed in paragraph 23 of the guidance and in particular on:*
>
> - *toxicology and adverse reactions in humans,*
> - *dependence and abuse potential*
> - *therapeutic applications, extent of therapeutic use and epidemiology of medical use; and*
> - *current international controls and their impact, and current and past national controls.*

[1] It should be noted that although the starting materials for Sativex are extracted from cannabis, dronabinol and its preparations are controlled under the United Nations Convention on Psychoactive Substances and cannabidiol is not subject to substance control.

Aspects related to different properties of various types of cannabis and its resin

Cannabis and cannabis resin are separately scheduled in the Single Convention. Over 60 cannabinoids were identified in *Cannabis* sativa L., but many of these are not or only marginally explored for their properties. *(26)* They may be agonists, partial antagonists, antagonists or pharmacologically inactive cannabinoids. Moreover, plant material contains also many substances from various other classes. The typical number of substances that can be identified in a plant is 700 – 1000, most of them not psychoactive substances. However, it should be considered that the non-psychoactive constituents may influence the uptake of the psychoactive and other constituents (e.g. terpenes) or may partially counteract the psychoactivity as a partial antagonist (e.g. (+)-cannabidiol or cannabinol; the latter being a decomposition product). Both genotype and phenotype can make a difference for the actual composition of a cannabis batch. These differences can have consequences for the psychopharmacological and other pharmacological activity of the plant. *(27)*

Therefore, there is not "one cannabis", but the actual content of THC can vary from very low (under 0.9% for the approved industrial varieties in the EU to up to 28% (strength based on content of the flowering tops). Moreover, also the variety in cannabinoid profiles and the divergent presence of uptake enhancers causes a diversity of properties of the many cannabis varieties. The question is whether this makes a difference for the scheduling of cannabis and cannabis resin.

> *When the Committee will evaluate cannabis and its resin, it is recommended that it considers whether all cannabis and cannabis resin, mild intermediate and strong, should be scheduled in the same way; the review report should therefore, if possible, contain the information that warrants a Committee decision.*

Other considerations

Quality assurance of medicinal cannabis

Where there is no government control over the cultivated medicinal cannabis, producers do not necessarily apply basic Good Production Practices like GAP, GMP, GLcP and GDP practices. This is even more prominent in case of seized cannabis for medical use. This has consequences for the safety and efficacy of the medicinal cannabis:

- there can be considerable batch-to-batch variation in strength and the qualitative composition of the medicine, resulting in varying effectiveness.
- cannabis is known for containing *Aspergillus* fumigatus L., a fungus that can infect the user and produces toxins that may provoke a psychosis. A Dutch study compared illegal cannabis batches with medicinal cannabis produced under state control. Some samples of the former contained up to 480,000 CFU/gram, while the latter was produced with very low levels of the fungus and then sterilized. *(28)*
- contamination can also derive from pesticides used during production or from heavy metals in the substrate (e.g. rockwool).

An example of production with good quality assurance is the Dutch medicinal cannabis. This is produced under responsibility of the Ministry of Health and meets a number of quality requirements: constant strength on dronabinol and constant composition of secondary cannabinoids, absence of microbiological contamination, pesticides and heavy metals, and humidity. Where there is a norm provided in the European Pharmacopoea, this norm is followed. *(29)*

When the Committee will evaluate the medical and scientific use of cannabis and its resin, it is recommended that it reports on the necessity of a safe and constant product assured by a system of quality assurance and standardized cultivation, and free of microbiological and chemical contamination and that it explains the health hazards related to varying composition and contamination.

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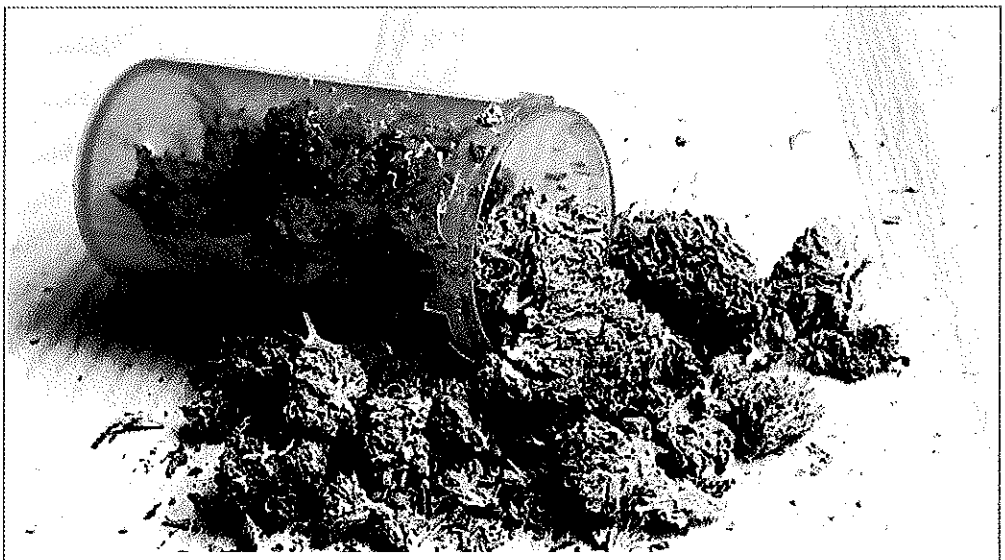
Cannabis extract can have dramatic effect on brain cancer, says new research

Date: November 14, 2014

Source: University of St George's London

Experts have shown that when certain parts of cannabis are used to treat cancer tumours alongside radio therapy treatment the growths can virtually disappear.

The new research by specialists at St George's, University of London, studied the treatment of brain cancer tumours in the laboratory and discovered that the most effective treatment was to combine active chemical components of the cannabis plant which are called cannabinoids.



Experts have shown that when certain parts of cannabis are used to treat cancer tumours alongside radio therapy treatment the growths can virtually disappear.

Credit: © jeremynathan / Fotolia

Two of these called tetrahydrocannabinol (THC) and cannabidiol (CBD) were tested as part of the research into brain cancer which is particularly difficult to treat and claims the lives of about 5,200 each year. It also has a particularly poor prognosis as the rate of survival after five years of patients' diagnosis is around 10%.

Cannabinoids are the active chemicals in cannabis and are also known more specifically as phytocannabinoids. There are 85 known cannabinoids in the cannabis plant.

The new research is the first to show a drastic effect when combining THC and CBD with irradiation. Tumours growing in the brains of mice were drastically slowed down when THC/CBD was used with irradiation.

Dr Wai Liu, Senior Research Fellow and lead researcher on the project, said: "The results are extremely exciting. The tumours were treated in a variety of ways, either with no treatment, the cannabinoids alone, and irradiation alone or with both the cannabinoids and irradiation at the same time.

"Those treated with both irradiation and the cannabinoids saw the most beneficial results and a drastic reduction in size. In some cases, the tumours effectively disappeared in the animals. This augurs well for further research in humans in the future. At the moment this is a mostly fatal disease.

"The benefits of the cannabis plant elements were known before but the drastic reduction of brain cancers if used with irradiation is something new and may well prove promising for patients who are in gravely serious situations with such cancers in the future."

The research team are discussing the possibility of combining cannabinoids with irradiation in a human clinical trial.

The research has been published in the *Molecular Cancer Therapeutics* journal.

Cannabinoids are the active chemicals in cannabis and are also known more specifically as phytocannabinoids. There are 85 known cannabinoids in the cannabis plant. The primary psychoactive component of cannabis is called tetrahydrocannabinol (THC).

Story Source:

The above story is based on materials provided by **University of St George's London**. *Note: Materials may be edited for content and length.*

Journal Reference:

1. Katherine A. Scott, Angus G. Dalgleish, and Wai M. Liu. **The Combination of Cannabidiol and Δ9-Tetrahydrocannabinol Enhances the Anticancer Effects of Radiation in an Orthotopic Murine Glioma Model**. *Molecular Cancer Therapeutics*, 2014; DOI: 10.1158/1535-7163.MCT-14-0402

Cite This Page:

MLA APA Chicago

University of St George's London. "Cannabis extract can have dramatic effect on brain cancer, says new research." ScienceDaily. ScienceDaily, 14 November 2014. <www.sciencedaily.com/releases/2014/11/141114085629.htm>.

LSA
LEGISLATIVE SERVICES AGENCY

Iowa General Assembly

2014 Committee Briefings

Legislative Services Agency -- Legal Services Division https://www.legis.iowa.gov/committees/committee?ga=85&session=2&groupID=21380

CANNABIDIOL IMPLEMENTATION STUDY COMMITTEE

Meeting Dates: September 11, 2014

Purpose. *This compilation of briefings on legislative interim committee meetings and other meetings and topics of interest to the Iowa General Assembly, written by the Legal Services Division staff of the nonpartisan Legislative Services Agency, describes committee activities or topics. The briefings were originally distributed in the Iowa Legislative Interim Calendar and Briefing. Official minutes, reports, and other detailed information concerning the committee or topic addressed by a briefing can be obtained from the committee's Internet page listed above, from the Iowa General Assembly's Internet page at https://www.legis.iowa.gov/, or from the agency connected with the meeting or topic described.*

CANNABIDIOL IMPLEMENTATION STUDY COMMITTEE

September 11, 2014

Co-chairperson: Senator Joe Bolkcom
Co-chairperson: Representative Walt Rogers

Background. The Cannabidiol Implementation Study Committee was created by the Legislative Council for the 2014 Interim and approved to hold one meeting. The charge of the committee is to monitor the implementation of the limited legalization of use in this state of cannabidiol, to consider whether the new law is helping the people it is supposed to help, and to review the University of Iowa College of Medicine research study called for by the legislation.

Medical Cannabidiol Act Overview. Ms. Rachele Hjelmaas, Senior Legal Counsel, LSA Legal Services, provided a summary overview of 2014 Iowa Acts, SF 2360, the Medical Cannabidiol Act. The Act includes the following:

- Allows for the medical use of cannabidiol, as defined in the Act, for alleviating symptoms caused by intractable epilepsy under certain narrowly defined conditions. An Iowa neurologist who has examined and treated a patient suffering from intractable epilepsy may provide but has no duty to provide a written recommendation for the patient's medical use of cannabidiol to treat or alleviate symptoms of intractable epilepsy, if certain criteria are met.
- A recommendation for the possession or use of cannabidiol shall be provided exclusively by a patient's in-state neurologist, shall be obtained from an out-of-state source, and shall only be recommended for oral or transdermal administration.
- The Iowa Department of Public Health (DPH) may approve the issuance of annual and renewal cannabidiol registration cards by the Iowa Department of Transportation (DOT) to a patient and to a primary caretaker of the patient who is at least 18 if certain criteria are met, and the patient or primary caretaker submits an application to DPH with certain information.
- A patient must be a permanent resident of Iowa.
- DPH is required to maintain a confidential file of the names of each patient and primary caregiver issued a cannabidiol registration card. However, certain information may be released to authorized persons under certain circumstances.
- The Act provides affirmative and complete defense provisions from criminal prosecution in this state for qualifying neurologists, patients, and primary caregivers who comply with the provisions of the Act for activities arising directly out of or directly related to the recommendation or use of cannabidiol in the treatment of a patient diagnosed with intractable epilepsy, and these defenses apply only if the quantity of cannabidiol oil does not exceed 32 ounces per patient.
- A person who knowingly or intentionally possesses or uses cannabidiol in violation of the Act is subject to the

penalties of Iowa Code chapters 124 (Controlled Substances Act) and 453B (Excise Tax on Unlawful Dealing in Certain Substances).

- The Act is repealed July 1, 2017.
- The University of Iowa Carver College of Medicine and College of Pharmacy are required to submit an annual report detailing the scientific literature, studies, and clinical trials regarding the use of cannabidiol on patients diagnosed with intractable epilepsy to the DPH and the General Assembly on or before July 1 of each year beginning July 1, 2015.

Rulemaking Process and Implementation—Update. Ms. Deborah Thompson, Policy Advisor and Healthiest State Initiative Coordinator, DPH, and Ms. Kim Snook, Director of Driver Services, and Mr. Mark Lowe, Motor Vehicle Division Director, DOT. Ms. Thompson presented an overview of the DPH administrative rulemaking process intended to implement the registration card program, including the application process, and Ms. Snook and Mr. Lowe answered specific committee member questions about the DOT issuance of the registration cards, including expected costs to DOT associated with the issuance.

Ms. Thompson stated that the administrative rules were written in collaboration to reflect the language in SF 2360 with DOT and key stakeholders. Notice of Intended Action was published in the August 6, 2014, Iowa Administrative Bulletin. The majority of public comments to the noticed rules recommended changes to the legislation and therefore fell outside of the scope of the administrative rules. The State Board of Health adopted some changes to the noticed rules on September 10, 2014, including a revised definition of "permanent resident," an additional option for valid photo identification in the application process, and revisions to the renewal process. The department also removed the requirement for the recommending neurologist to physically examine a patient before issuing a written recommendation to better align with SF 2360 and added additional language to clarify that aggregate and statistical information that does not provide any patient identifiers can be made available to the public upon request. The rules become effective January 30, 2015.

Ms. Thompson also provided a flowchart on the basic card application process. Ms. Snook and Mr. Lowe answered questions about DOT's role in issuing the cannabidiol registration cards, as well as funding concerns.

Committee members expressed concern about getting people the help they so desperately need under the law and raised concerns about the January 30, 2015, implementation date. Some members suggested that other administrative processes might have sped up the implementation of the law. Ms. Thompson responded that both the DPH and DOT have made every effort to work as quickly as possible to implement the law, and that there are many moving parts to work through and that additional details are still being worked out. She also noted that DPH may be able to allow people to apply earlier and have the registration cards ready prior to the January 30 date.

Cannabidiol Research Studies. Dr. Charuta Joshi, Clinical Associate Professor of Pediatrics with specialties in Neurology and Epilepsy, University of Iowa Carver College of Medicine, provided information on scientific research evaluating the role of cannabidiol in the control of refractory seizures. She explained that two strains of cannabis exist: Sativa, which contains more THC (tetrahydrocannabinol) and indica which contains more CBD (cannabidiol). THC is the psychoactive component of cannabis that produces a high, and CBD is a nonpsychoactive component. Depending upon variables involved in the process of production and processing of cannabis, such as temperature, fertilizer, etc., the concentration of THC and CBD can vary greatly and cannabis on the street may be pure THC. Dr. Joshi stated that intractable epilepsy is based on a person not responding to two or more effective medications, not on the number of seizures a person experiences. She further explained that in a number of research studies, CBD has been shown to be effective as an anticonvulsant in some patients, although what dosage is effective is not known, and that in such research, the use of CBD had no life-threatening side effects. In contrast, the 15-20 medications currently used as anticonvulsants for persons with epilepsy and other psychiatric illnesses have resulted in negative side effects including liver and kidney toxicity. CBD also has been found to not have addictive potential as some other medications do.

Dr. Joshi also noted that when plant extracts are used, there is no way to ensure the ratio of CBD to THC without standardization; however GW Pharmaceuticals is developing a standardized pure strain of CBD. The University of Iowa will be taking part in double-blind studies sponsored by GW Pharmaceuticals to learn more about cannabidiol in ways doctors have not been able to do so far. Participating patients may or may not be from Iowa. The product that will be used at the University of Iowa Children's Hospital test site in the double-blind studies is from a cloned plant that produces pure CBD and is a consistent product. GW Pharmaceuticals will provide all of the CBD used in the study. GW Pharmaceuticals has provided CBD to hundreds of children in the United States with no resultant life-threatening side effects. The results of the study will be in the public domain.

Committee members posed questions to Dr. Joshi about the research studies including questions relating to the purity of the cannabidiol that patients might obtain now from other states. Dr. Joshi stated that the concern is not with CBD per se but as for standardization of the product and the effective concentration amount. She noted that the Iowa Board of Pharmacy had also requested a literature review regarding medical cannabis.

Personal and Professional Perspectives—Impact Panel. Ms. Sally Gaer, Ms. Maria LaFrance, and Ms. April Stumpf, medical cannabidiol consumer advocates; Ms. Roxanne Cogil, Iowa Epilepsy Foundation; and Dr. David Moore, a

neurologist specializing in epilepsy and a member of the Iowa Neurological Association, offered personal and professional perspectives on the impact of SF 2360. Ms. Gaer, Ms. LaFrance, and Ms. Stumpf are all parents of children with intractable epilepsy and were very involved in the efforts supporting SF 2360 during the 2014 Session. They thanked legislators for their work and support in passing the legislation, but expressed concerns with the restrictions in the law that prevent families from getting in-state access to the medical cannabidiol they are in desperate need of to treat their children.

- Ms. Gaer, the parent of an adult daughter with Dravet Syndrome, a chronic illness characterized by persistent seizures, provided comments advocating for in-state access for medical cannabidiol in Iowa and the need for in-state medical dispensaries and greenhouse growing regulations. She also proposed Iowa legislators take a field trip to other states with medical cannabis dispensaries to research well-run cannabis dispensary programs.
- Ms. LaFrance spoke about her six-year-old son, who also suffers from Dravet Syndrome, and the dangerous side effects of his prescription medication. She also spoke about access concerns as well as the excessive costs families face and suggested Iowa should look to states like Oregon, New Mexico, and Colorado for examples of a well-run cannabis program.
- Ms. Stumpf, a parent of a two-year-old daughter who has 50-70 seizures per day, commented that prescription medication has not been effective in managing her daughter's illness. She urged committee members to remove the legal and financial barriers from the current legislation and to allow the Iowa Department of Agriculture or other entity to supervise and control the production of in-state greenhouse dispensaries.
- Ms. Cogil, also a parent of a child with intractable epilepsy, echoed the parents' concerns that the law does not provide meaningful access to cannabidiol because the law does not allow for the in-state production, processing, and dispensing of cannabidiol, which means that persons in Iowa in need of cannabidiol have to travel out of state to obtain the cannabidiol, risking violations of other state and federal laws.
- Dr. Moore, who treats patients with epilepsy and who himself suffers from epilepsy, expressed concern about the fact that although approximately 3 percent of Iowa's population have epilepsy (more than 90,000), only about 12,000 patients are potential candidates for medical cannabidiol under the restrictions in the law. He also expressed concern about the financial burden on families in accessing and using the cannabidiol oil, and that few neurologists practicing in Iowa even treat patients with epilepsy.

Public Comment. Individual commenters included comments from parents of children with intractable epilepsy and persons suffering from other chronic illnesses including chronic pain syndrome, cancer, Ehlers–Danlos Syndrome (EDS) (an inherited connective tissue disorder), and other debilitating illnesses, who spoke about the medical benefits of cannabidiol oil and other forms of medical cannabis as well as financial and legal obstacles to out-of-state access.

Committee Discussion and Recommendations. Each member of the committee was invited to make recommendations and committee members discussed and voted on each recommendation. The recommendations approved by the committee for further consideration by the General Assembly are summarized as follows:

- Develop a regulated program to produce, process, and dispense medical cannabis and further recommend that medical cannabis not be taxed by the state at any stage of producing, processing, or dispensing the medical cannabis.
- Reschedule marijuana from a schedule I controlled substance to a schedule II controlled substance.
- Further investigate access, standardization, and legalization of cannabidiol.

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Internet Page: https://www.legis.iowa.gov/committees/committee?ga=85&session=2&groupID=21380

Invited Commentary

Legalization of Medical Marijuana and Incidence of Opioid Mortality

Marie J. Hayes, PhD; Mark S. Brown, MD

The rapid acceleration of prescription opioid-related overdose deaths in the United States is correlated with the availability of stronger opioid medications, as well as a change in medical practice from withholding opioid medication because of dependence risk[1] to treating patients with chronic pain with opioids. Subsequently, the pendulum of concern has swung again, driven by the public health crisis of rising opioid analgesic addiction, overdose, and death. Opioid medications are problematic as a treatment for chronic pain. Opioid pharmaceuticals cause other adverse effects when used for long periods, such as tolerance, hyperalgesia, and gastrointestinal complications, making this class of drugs a poor choice for long-term use. As is well known, prescription opioids also have great abuse potential due to their influence on stress and reward circuits in the brain, promoting nonmedical use and abuse and diversion of prescription medications.

Related article

In this issue, Bachhuber et al[2] examine the link between medical marijuana laws and unintentional overdose mortality in which an opioid analgesic was identified. Using Centers for Disease Control and Prevention data, states with and without medical marijuana laws were contrasted for age-adjusted, opioid-related mortality. Overall, the incidence of opioid analgesic–associated mortality rose dramatically across the study period (1999-2010). States with medical marijuana laws had higher overdose rates than did those without such laws when population-adjusted mortality was analyzed across years, although the rise in deaths over the study period was similar for both groups. In contrast, a convincing protective effect of medical marijuana laws was found in a covariate-adjusted, time-series model in which opioid analgesic mortality declined steadily based on years since medical marijuana laws were enacted, termed *implementation*. The model included an analysis of the impact of critical policies for prescription opioid regulatory efforts: prescription monitoring programs, pharmacist collection of patient information, state and oversight of pain management clinics, as well as state unemployment rates. In states with medical marijuana laws, age-adjusted overdose deaths in which opioids were present declined in yearly estimates since medical marijuana law implementation. Indeed, across the 13 states that approved medical marijuana laws in the study period, the decline in opioid overdose mortality strengthened over time, achieving a mean decline of 24.8%. Worthy of note, a weak contribution was found for state oversight policies such as prescription monitoring and pain management clinics; this finding has been reported previously.[3] The striking implication is that medical marijuana laws, when implemented, may represent a promising approach for stemming runaway rates of nonintentional opioid analgesic-related deaths. If true, this finding upsets the applecart of conventional wisdom regarding the public health implications of marijuana legalization and medicinal usefulness.

The difficulty in endorsing the medical marijuana protective hypothesis is that medical marijuana laws are heterogeneous across states, engender controversy in state legislatures, and produce varied approaches.[4] Bachhuber et al[2] arguably capture this best in the implementation time-lag measure. Once medical marijuana laws are passed, states struggle to develop policies for patient eligibility and access but universally accept chronic pain as the most appropriate medical condition. Federal enforcement agencies (who list marijuana as a Schedule I drug with no medical value) challenge states during implementation, most commonly when distribution centers or dispensaries are authorized as a solution to patient access. The cross-state variability in the implementation variable and its dynamic changing nature make it hard to define what the implementation proxy is measuring. The assumption that improvement in medical marijuana access policies occurs gradually, as patients with pain become enrolled over time, is reasonable. What is novel in the contribution of Bachhuber et al[2] is the suggestion that what is being tracked is an evolving drug policy that may mitigate the secular rise in opioid analgesic–related deaths.

If medical marijuana laws afford a protective effect, it is not clear why. If the decline in opioid analgesic–related overdose deaths is explained, as claimed by the authors, by increased access to medical marijuana as an adjuvant medication for patients taking prescription opioids, does this mean that marijuana provides improved pain control that decreases opioid dosing to safer levels? Research[5] supports the hypothesis that cannabinoid receptors (CB1 and CB2) operate as a parallel, independent analgesic system. Endogenous cannabinoids block pain signals in pain centers such as the periaqueductal gray, and decrease activation in the locus coeruleus, which regulates sympathetic activation during stress. Preclinical and clinical trial pharmacologic studies[6,7] have shown independent analgesic action of medical marijuana and augmented analgesia when a cannabinoid CB1 agonist is added to an opioid background.

In the present study,[2] the authors stress that approximately 60% of the decedents possessed a valid opioid analgesic prescription from a single provider. Although the epidemiologic data sources are robust and the time-series approach is convincing, it is unlikely that improved pain control with the use of marijuana in patients with chronic pain is the primary driver for the observed decline in opioid overdose. Indeed, the remaining 40% of the decedents in this cohort without a valid opioid prescription were not likely patients with pain. The report provides no information

on the health history of the decedents with or without valid prescriptions, such as a history of multiple providers, comorbid polypharmacy, and poor health (eg, obesity), which are associated with overdose mortality.

Opioid overdose–associated mortality in the group without a valid prescription is likely related to opiate and polydrug/alcohol addiction developed through recreational abuse, most often presaged by longstanding psychiatric illness. In a recent study[8] of past-year, nonmedical prescription opioid use, individuals with abuse or dependence were more likely to have psychiatric symptoms, such as panic and agoraphobia, report poor health, have misused another class of prescription medication, used heroin, and initiated substance use before age 13. In Maine, where the rates of opioid analgesic overdose deaths are high, addiction and related psychiatric disorders represent an estimated 50% of opioid analgesic–related deaths.[9] Increased access to medical-grade marijuana, procured legally or illegally, may offer an alternative intoxicant that may compete with opiate misuse and, thereby, be similarly protective. Preclinical and imaging studies[10] have established that the psychogenic "pain" of psychiatric illness, which often leads to drug and alcohol abuse and addiction, operates through the same neural circuits as pain generated by other medical conditions. Both opioids and cannabinoids independently reduce stress reactivity and increase dopamine-mediated reward. Hence, medical marijuana use may similarly lessen the drive to use opiates at lethal levels in individuals with nonpain, psychiatric conditions who have psychotropic medications as a frequent concomitant of exposure at the time of death. It is also possible that for some, medical marijuana is a substitute for opioids, rather than an adjuvant. The potential protective role of medical marijuana in opioid analgesic–associated mortality and its implication for public policy is a fruitful area for future work.

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Published Online: August 25, 2014. doi:10.1001/jamainternmed.2014.2716.

Conflict of Interest Disclosures: None reported.

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Original Investigation

Medical Cannabis Laws and Opioid Analgesic Overdose Mortality in the United States, 1999-2010

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Invited Commentary

IMPORTANCE Opioid analgesic overdose mortality continues to rise in the United States, driven by increases in prescribing for chronic pain. Because chronic pain is a major indication for medical cannabis, laws that establish access to medical cannabis may change overdose mortality related to opioid analgesics in states that have enacted them.

OBJECTIVE To determine the association between the presence of state medical cannabis laws and opioid analgesic overdose mortality.

DESIGN, SETTING, AND PARTICIPANTS A time-series analysis was conducted of medical cannabis laws and state-level death certificate data in the United States from 1999 to 2010; all 50 states were included.

EXPOSURES Presence of a law establishing a medical cannabis program in the state.

MAIN OUTCOMES AND MEASURES Age-adjusted opioid analgesic overdose death rate per 100 000 population in each state. Regression models were developed including state and year fixed effects, the presence of 3 different policies regarding opioid analgesics, and the state-specific unemployment rate.

RESULTS Three states (California, Oregon, and Washington) had medical cannabis laws effective prior to 1999. Ten states (Alaska, Colorado, Hawaii, Maine, Michigan, Montana, Nevada, New Mexico, Rhode Island, and Vermont) enacted medical cannabis laws between 1999 and 2010. States with medical cannabis laws had a 24.8% lower mean annual opioid overdose mortality rate (95% CI, −37.5% to −9.5%; $P = .003$) compared with states without medical cannabis laws. Examination of the association between medical cannabis laws and opioid analgesic overdose mortality in each year after implementation of the law showed that such laws were associated with a lower rate of overdose mortality that generally strengthened over time: year 1 (−19.9%; 95% CI, −30.6% to −7.7%; $P = .002$), year 2 (−25.2%; 95% CI, −40.6% to −5.9%; $P = .01$), year 3 (−23.6%; 95% CI, −41.1% to −1.0%; $P = .04$), year 4 (−20.2%; 95% CI, −33.6% to −4.0%; $P = .02$), year 5 (−33.7%; 95% CI, −50.9% to −10.4%; $P = .008$), and year 6 (−33.3%; 95% CI, −44.7% to −19.6%; $P < .001$). In secondary analyses, the findings remained similar.

CONCLUSIONS AND RELEVANCE Medical cannabis laws are associated with significantly lower state-level opioid overdose mortality rates. Further investigation is required to determine how medical cannabis laws may interact with policies aimed at preventing opioid analgesic overdose.

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JAMA Intern Med. doi:10.1001/jamainternmed.2014.4005
Published online August 25, 2014.

Chronic noncancer pain is common in the United States,[1] and the proportion of patients with noncancer pain who receive prescriptions for opioids has almost doubled over the past decade.[2] In parallel to this increase in prescriptions, rates of opioid use disorders and overdose deaths have risen dramatically.[3,4] Policies such as prescription drug monitoring programs, increased scrutiny of patients and providers, and enhanced access to substance abuse treatment have been advocated to reduce the risk of opioid analgesics[5]; however, relatively less attention has focused on how the availability of alternative nonopioid treatments may affect overdose rates.

As of July 2014, a total of 23 states have enacted laws establishing medical cannabis programs[6] and chronic or severe pain is the primary indication in most states.[7-10] Medical cannabis laws are associated with increased cannabis use among adults.[11] This increased access to medical cannabis may reduce opioid analgesic use by patients with chronic pain, and therefore reduce opioid analgesic overdoses. Alternatively, if cannabis adversely alters the pharmacokinetics of opioids or serves as a "gateway" or "stepping stone" leading to further substance use,[12-14] medical cannabis laws may increase opioid analgesic overdoses. Given these potential effects, we examined the relationship between implementation of state medical cannabis laws and opioid analgesic overdose deaths in the United States between 1999 and 2010.

Methods

The opioid analgesic overdose mortality rate in each state from 1999 to 2010 was abstracted using the Wide-ranging Online Data for Epidemiologic Research interface to multiple cause-of-death data from the Centers for Disease Control and Prevention.[15] We defined opioid analgesic overdose deaths as fatal drug overdoses of any intent (*International Statistical Classification of Diseases, 10th revision* [*ICD-10*], codes X40-X44, X60-X64, and Y10-Y14) where an opioid analgesic was also coded (T40.2-T40.4). This captures all overdose deaths where an opioid analgesic was involved including those involving polypharmacy or illicit drug use (eg, heroin). Analysis of publicly available secondary data is considered exempt by the University of Pennsylvania Institutional Review Board.

Three states (California, Oregon, and Washington) had medical cannabis laws effective prior to 1999.[6] Ten states (Alaska, Colorado, Hawaii, Maine, Michigan, Montana, Nevada, New Mexico, Rhode Island, and Vermont) implemented medical cannabis laws between 1999 and 2010. Nine states (Arizona, Connecticut, Delaware, Illinois, Maryland, Massachusetts, Minnesota, New Hampshire, and New York) had medical cannabis laws effective after 2010, which is beyond the study period. New Jersey's medical cannabis law went into effect in the last quarter of 2010 and was counted as effective after the study period. In each year, we first plotted the mean age-adjusted opioid analgesic overdose mortality rate in states that had a medical cannabis law vs states that did not.

Next, we determined the association between medical cannabis laws and opioid analgesic–related deaths using linear time-series regression models. For the dependent variable, we used the logarithm of the year- and state-specific age-adjusted opioid analgesic overdose mortality rate. Our main independent variable of interest was the presence of medical cannabis laws, which we modeled in 2 ways.

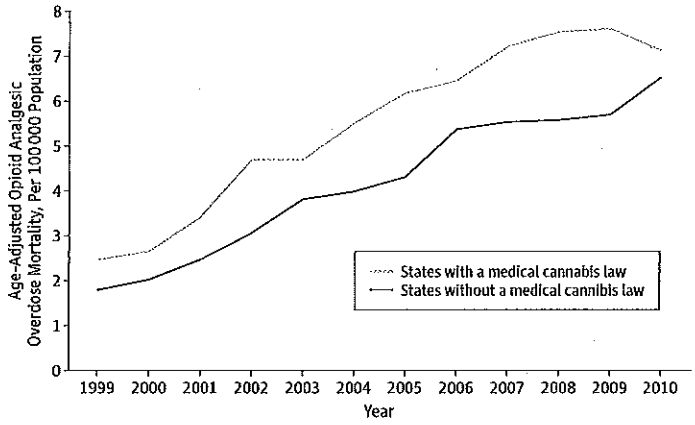
In our first regression model, we included an indicator for the presence of a medical cannabis law in the state and year. All years prior to a medical cannabis law were coded as 0 and all years after the year of passage were coded as 1. Because laws could be implemented at various points in the year, we coded the law as a fraction for years of implementation (eg, 0.5 for a law that was implemented on July 1). The coefficient on this variable therefore represents the mean difference, expressed as a percentage, in the annual opioid analgesic overdose mortality rate associated with the implementation of medical cannabis laws. To estimate the absolute difference in mortality associated with medical cannabis laws in 2010, we calculated the expected number of opioid analgesic overdose deaths in medical cannabis states had laws not been present and subtracted the actual number of overdose deaths recorded.

In our second model, we allowed the effect of medical cannabis laws to vary depending on the time elapsed since enactment, because states may have experienced delays in patient registration, distribution of identification cards, and establishment of dispensaries, if applicable. Accordingly, we coded years with no law present as 0, but included separate coefficients to measure each year since implementation of the medical cannabis law for states that adopted such laws. States that implemented medical cannabis laws before the study period were coded similarly (eg, in 1999, California was coded as 3 because the law was implemented in 1996). This model provides separate estimates for 1 year after implementation, 2 years after implementation, and so forth.

Each model adjusted for state and year (fixed effects). We also included 4 time-varying state-level factors: (1) the presence of a state-level prescription drug monitoring program (a state-level registry containing information on controlled substances prescribed in a state),[16] (2) the presence of a law requiring or allowing a pharmacist to request patient identification before dispensing medications,[17] (3) the presence of regulations establishing increased state oversight of pain management clinics,[18] and (4) state- and year-specific unemployment rates to adjust for the economic climate.[19] Colinearity among independent variables was assessed by examining variance inflation factors; no evidence of colinearity was found. For all models, robust standard errors were calculated using procedures to account for correlation within states over time.

To assess the robustness of our results, we performed several further analyses. First, we excluded intentional opioid analgesic overdose deaths from the age-adjusted overdose mortality rate to focus exclusively on nonsuicide deaths. Second, because heroin and prescription opioid use are interrelated for some individuals,[20-23] we included overdose deaths related to heroin, even if no opioid analgesic was coded. Third, we assessed the robustness of our findings to the inclusion of state-specific linear time trends that can be used to adjust for differential factors that changed linearly over the study period (eg, hard-to-measure attitudes or cultural changes). Fourth, we tested whether trends in opioid analgesic overdose mortality

Figure 1. Mean Age-Adjusted Opioid Analgesic Overdose Death Rate



States with medical cannabis laws compared with states without such laws in the United States, 1999-2010.

Table. Association Between Medical Cannabis Laws and State-Level Opioid Analgesic Overdose Mortality Rates in the United States, 1999-2010

	Percentage Difference in Age-Adjusted Opioid Analgesic Overdose Mortality in States With vs Without a Law		
	Primary Analysis	Secondary Analyses	
Independent Variable[a]	Estimate (95% CI)[b]	Estimate (95% CI)[c]	Estimate (95% CI)[d]
Medical cannabis law	−24.8 (−37.5 to −9.5)[e]	−31.0 (−42.2 to −17.6)[f]	−23.1 (−37.1 to −5.9)[e]
Prescription drug monitoring program	3.7 (−12.7 to 23.3)	3.5 (−13.4 to 23.7)	7.7 (−11.0 to 30.3)
Law requiring or allowing pharmacists to request patient identification	5.0 (−10.4 to 23.1)	4.1 (−11.4 to 22.5)	2.3 (−15.4 to 23.7)
Increased state oversight of pain management clinics	−7.6 (−19.1 to 5.6)	−11.7 (−20.7 to −1.7)[e]	−3.9 (−21.7 to 18.0)
Annual state unemployment rate[g]	4.4 (−0.3 to 9.3)	5.2 (0.1 to 10.6)[e]	2.5 (−2.3 to 7.5)

[a] All models adjusted for state and year (fixed effects).

[b] $R^2 = 0.876$.

[c] All intentional (suicide) overdose deaths were excluded from the dependent variable; opioid analgesic overdose mortality is therefore deaths that are unintentional or of undetermined intent. All covariates were the same as in the primary analysis; $R^2 = 0.873$.

[d] Findings include all heroin overdose deaths, even if no opioid analgesic was involved. All covariates were the same as in the primary analysis. $R^2 = 0.842$.

[e] $P \leq .05$.

[f] $P \leq .001$.

[g] An association was calculated for a 1-percentage-point increase in the state unemployment rate.

predated the implementation of medical cannabis laws by including indicator variables in a separate regression model for the 2 years before the passage of the law.[24] Finally, to test the specificity of any association found between medical cannabis laws and opioid analgesic overdose mortality, we examined the association between state medical cannabis laws and age-adjusted death rates of other medical conditions without strong links to cannabis use: heart disease (*ICD-10* codes I00-I09, I11, I13, and I20-I51)[25] and septicemia (A40-A41). All analyses were performed using SAS, version 9.3 (SAS Institute Inc).

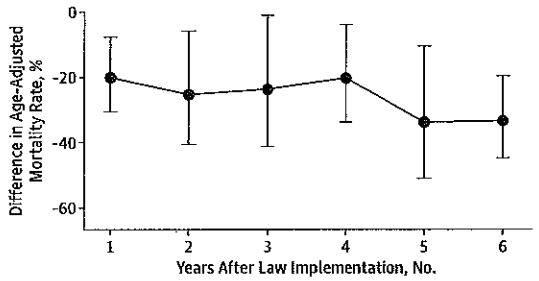
Results

The mean age-adjusted opioid analgesic overdose mortality rate increased in states with and without medical cannabis laws during the study period (**Figure 1**). Throughout the study period, states with medical cannabis laws had a higher opioid analgesic overdose mortality rate and the rates rose for both groups; however, between 2009 and 2010 the rate in states with medical cannabis laws appeared to plateau.

In the adjusted model, medical cannabis laws were associated with a mean 24.8% lower annual rate of opioid analgesic overdose deaths (95% CI, −37.5% to −9.5%; $P = .003$) (**Table**), compared with states without laws. In 2010, this translated to an estimated 1729 (95% CI, 549 to 3151) fewer deaths than expected. Medical cannabis laws were associated with lower rates of opioid analgesic overdose mortality, which generally strengthened in the years after passage (**Figure 2**): year 1 (−19.9%; 95% CI, −30.6% to −7.7%; $P = .002$), year 2 (−25.2%; 95% CI, −40.6% to −5.9%; $P = .01$), year 3 (−23.6%; 95% CI, −41.1% to −1.0%; $P = .04$), year 4 (−20.2%; 95% CI, −33.6% to −4.0%; $P = .02$), year 5 (−33.7%; 95% CI, −50.9% to −10.4%; $P = .008$), and year 6 (−33.3%; 95% CI, −44.7% to −19.6%; $P < .001$). The other opioid analgesic policies, as well as state unemployment rates, were not significantly associated with opioid analgesic mortality rates.

In additional analyses, the association between medical cannabis laws and opioid analgesic mortality rates was similar after excluding intentional deaths (ie, suicide) and when including all heroin overdose deaths, even if an opioid analgesic was not involved (Table). Including state-specific linear

Figure 2. Association Between Medical Cannabis Laws and Opioid Analgesic Overdose Mortality in Each Year After Implementation of Laws in the United States, 1999-2010



Point estimate of the mean difference in the opioid analgesic overdose mortality rate in states with medical cannabis laws compared with states without such laws; whiskers indicate 95% CIs.

time trends in the model resulted in a borderline significant association between laws and opioid analgesic overdose mortality (−17.9%; 95% CI, −32.7% to 0.3%; $P = .054$). When examining the years prior to law implementation, we did not find an association between medical cannabis laws and opioid analgesic overdose mortality 2 years prior to law implementation (−13.1%; 95% CI, −45.5% to 38.6%; $P = .56$) or 1 year prior (1.2%; 95% CI, −41.2% to 74.0%; $P = .97$). Finally, we did not find significant associations between medical cannabis laws and mortality associated with heart disease (1.4%; 95% CI, −0.2% to 2.9%; $P = .09$) or septicemia (−1.8%; 95% CI, −7.6% to 4.3%; $P = .55$).

Discussion

In an analysis of death certificate data from 1999 to 2010, we found that states with medical cannabis laws had lower mean opioid analgesic overdose mortality rates compared with states without such laws. This finding persisted when excluding intentional overdose deaths (ie, suicide), suggesting that medical cannabis laws are associated with lower opioid analgesic overdose mortality among individuals using opioid analgesics for medical indications. Similarly, the association between medical cannabis laws and lower opioid analgesic overdose mortality rates persisted when including all deaths related to heroin, even if no opioid analgesic was present, indicating that lower rates of opioid analgesic overdose mortality were not offset by higher rates of heroin overdose mortality. Although the exact mechanism is unclear, our results suggest a link between medical cannabis laws and lower opioid analgesic overdose mortality.

Approximately 60% of all opioid analgesic overdose deaths occur among patients who have legitimate prescriptions from a single provider.[26] This group may be sensitive to medical cannabis laws; patients with chronic noncancer pain who would have otherwise initiated opioid analgesics may choose medical cannabis instead. Although evidence for the analgesic properties of cannabis is limited, it may provide analgesia for some individuals.[27,28] In addition, patients already receiving opioid analgesics who start medical cannabis treatment may experience improved analgesia and decrease their opioid dose,[29,30] thus potentially decreasing their dose-dependent risk of overdose.[31,32] Finally, if medical cannabis laws lead to decreases in polypharmacy—particularly with benzodiazepines—in people taking opioid analgesics, overdose risk would be decreased. Further analyses examining the association between medical cannabis laws and patterns of opioid analgesic use and polypharmacy in the population as a whole and across different groups are needed.

A connection between medical cannabis laws and opioid analgesic overdose mortality among individuals who misuse or abuse opioids is less clear. Previous laboratory work has shown that cannabinoids act at least in part through an opioid receptor mechanism[33,34] and that they increase dopamine concentrations in the nucleus accumbens in a fashion similar to that of heroin and several other drugs with abuse potential.[33,35] Clinically, cannabis use is associated with modest reductions in opioid withdrawal symptoms for some people,[36,37] and therefore may reduce opioid use. In contrast, cannabis use has been linked with increased use of other drugs, including opioids[14,38-40]; however, a causal relationship has not been established.[14,41] Increased access to cannabis through medical cannabis laws could influence opioid misuse in either direction, and further study is required.

Although the mean annual opioid analgesic overdose mortality rate was lower in states with medical cannabis laws compared with states without such laws, the findings of our secondary analyses deserve further consideration. State-specific characteristics, such as trends in attitudes or health behaviors, may explain variation in medical cannabis laws and opioid analgesic overdose mortality, and we found some evidence that differences in these characteristics contributed to our findings. When including state-specific linear time trends in regression models, which are used to adjust for hard-to-measure confounders that change over time, the association between laws and opioid analgesic overdose mortality weakened. In contrast, we did not find evidence that states that passed medical cannabis laws had different overdose mortality rates in years prior to law passage, providing a temporal link between laws and changes in opioid analgesic overdose mortality. In addition, we did not find evidence that laws were associated with differences in mortality rates for unrelated conditions (heart disease and septicemia), suggesting that differences in opioid analgesic overdose mortality cannot be explained by broader changes in health. In summary, although we found a lower mean annual rate of opioid analgesic mortality in states with medical cannabis laws, a direct causal link cannot be established.

This study has several limitations. First, this analysis is ecologic and cannot adjust for characteristics of individuals within the states, such as socioeconomic status, race/ethnicity, or medical and psychiatric diagnoses. Although we found that the association between medical cannabis

laws and lower opioid overdose mortality strengthened in the years after implementation, this could represent heterogeneity between states that passed laws earlier in the study period vs those that passed the laws later. Second, death certificate data may not correctly classify cases of opioid analgesic overdose deaths, and reporting of opioid analgesics on death certificates may differ among states; misclassification could bias our results in either direction. Third, although fixed-effects models can adjust for time-invariant characteristics of each state and state-invariant time effects, there may be important time- and state-varying confounders not included in our models. Finally, our findings apply to states that passed medical cannabis laws during the study period and the association between future laws and opioid analgesic overdose mortality may differ.

Conclusions

Although the present study provides evidence that medical cannabis laws are associated with reductions in opioid analgesic overdose mortality on a population level, proposed mechanisms for this association are speculative and rely on indirect evidence. Further rigorous evaluation of medical cannabis policies, including provisions that vary among states,[14,42] is required before their wide adoption can be recommended. If the relationship between medical cannabis laws and opioid analgesic overdose mortality is substantiated in further work, enactment of laws to allow for use of medical cannabis may be advocated as part of a comprehensive package of policies to reduce the population risk of opioid analgesics.

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Accepted for Publication: May 2, 2014.

Published Online: August 25, 2014. doi:10.1001/jamainternmed.2014.4005.

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Acquisition, analysis, or interpretation of data: Bachhuber, Cunningham, Barry.
Drafting of the manuscript: Bachhuber, Saloner.
Critical revision of the manuscript for important intellectual content: All authors.
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Conflict of Interest Disclosures: Dr Cunningham's husband was recently employed by Pfizer Pharmaceuticals and is currently employed by Quest Diagnostics. No other disclosures are reported.

Funding/Support: This work was funded by National Institutes of Health (NIH) grants R01DA032110 and R25DA023021 and the Center for AIDS Research at the Albert Einstein College of Medicine and Montefiore Medical Center grant NIH AI-51519. Dr Saloner received funding support from the Robert Wood Johnson Foundation Health and Society Scholars Program. Dr Bachhuber received funding support from the Philadelphia Veterans Affairs Medical Center and the Robert Wood Johnson Foundation Clinical Scholars Program.

Role of the Sponsor: The sponsors had no role in the design and conduct of the study; collection, management, analysis, and interpretation of the data; preparation, review, or approval of the manuscript; and decision to submit the manuscript for publication.

Disclaimer: The findings and conclusions of this article are those of the authors and do not necessarily reflect the position or policy of the Department of Veterans Affairs or the US government.

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Journal of Psychoactive Drugs, 46 (1), 73–77, 2014

ISSN: 0279-1072 print / 2159-9777 online
DOI: 10.1080/02791072.2013.873843

Routledge
Taylor & Francis Group

PTSD Symptom Reports of Patients Evaluated for the New Mexico Medical Cannabis Program

George R. Greer, M.D.[a]; Charles S. Grob, M.D.[b] & Adam L. Halberstadt, Ph.D.[c]

Abstract—*Background*: New Mexico was the first state to list post-traumatic stress disorder (PTSD) as a condition for the use of medical cannabis. There are no published studies, other than case reports, of the effects of cannabis on PTSD symptoms. The purpose of the study was to report and statistically analyze psychometric data on PTSD symptoms collected during 80 psychiatric evaluations of patients applying to the New Mexico Medical Cannabis Program from 2009 to 2011. *Methods*: The Clinician Administered Posttraumatic Scale for DSM-IV (CAPS) was administered retrospectively and symptom scores were then collected and compared in a retrospective chart review of the first 80 patients evaluated. *Results*: Greater than 75% reduction in CAPS symptom scores were reported when patients were using cannabis compared to when they were not. *Conclusions*: Cannabis is associated with reductions in PTSD symptoms in some patients, and prospective, placebo-controlled study is needed to determine efficacy of cannabis and its constituents in treating PTSD.

Keywords—cannabis, post-traumatic, stress, tetrahydrocannabinol, THC, treatment

INTRODUCTION

In 2009, New Mexico became the first state to explicitly authorize the use of medical cannabis for people with PTSD. Approved patients are allowed to purchase cannabis from licensed, non-profit growers/producers or to grow their own supply. The new regulation of cannabis use for PTSD required evaluation by a psychiatrist certifying: "(1) the aforementioned patient has a debilitating medical condition and the potential health benefits of the medical use of marijuana would likely outweigh health risks for the patient. 2) the aforementioned patient has current unrelieved symptoms that have failed other medical therapies" (New Mexico Department of Health 2012). Later, psychiatric nurse practitioners were authorized to conduct the evaluations. As of the most recent report available at this writing, there were 5,495 active medical cannabis patients, of whom 1,854 (34%) had PTSD and 1,355 had chronic pain (New Mexico Department of Health 2011).

A literature search of "cannabis AND PTSD" through PubMed yielded 42 references, some of which reported a positive association of PTSD with cannabis use (Bonn-Miller, Vujanovic & Drescher 2011; Cougle et al. 2011), or abuse and dependence (Cornelius et al. 2010). One article reviewed the anxiolytic properties of the cannabinoid, cannabidiol (Schier et al. 2012), and one included a case report and a thorough discussion on the use of cannabis as a PTSD treatment and possible mechanisms of action (Passie et al. 2012).

In one unpublished, open-label pilot study, smoked medical cannabis containing 23% tetrahydrocannabinol

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(THC) and less than 1% cannabidiol was administered to 29 male Israeli combat veterans with PTSD, with instructions to smoke it daily (Mashiah 2012). The baseline score on the Clinician Administered Posttraumatic Scale for DSM-IV (CAPS) was 98 for the entire group, and post-treatment scores in three subgroups after four to 11 months of treatment ranged from 54 to 60.

Soon after the New Mexico PTSD regulation went into effect, one of the authors [GG] began receiving unsolicited phone calls in his private practice from people asking to be evaluated as part of their application to the Program. In order to avoid evaluating patients who would be unlikely to qualify, telephone screening was conducted to determine whether they met the following criteria by self-report: (1) the experience of and emotional response to a trauma that met the DSM-IV Criterion A for PTSD; (2) the presence of several of the major symptoms in Criteria B, C, and D (reexperiencing, avoidance, and hyperarousal) of PTSD when not using cannabis; (3) significant relief of several major PTSD symptoms when using cannabis; and (4) lack of any harm or problems in functioning resulting from cannabis use. All patients who met these screening criteria were evaluated.

The CAPS was utilized during the evaluation to quantify the patients' symptoms retrospectively with and without cannabis use. The CAPS is a frequently used instrument in PTSD research that was developed by the National Center for PTSD and two Veterans Affairs medical centers (Blake et al. 1995). The instrument asks questions about the presence of traumatic experiences and the immediate emotional response to them described in DSM-IV Criterion A for PTSD, and asks for a rating of the frequency and intensity of all 17 symptoms in Criteria B, C, and D on a scale of 0 to 4. On the CAPS scoring form, the frequency and intensity scores are added to create a total score for that symptom; then a total score for all the symptoms within each criterion, and for all symptom criteria, are calculated.

During the evaluation, patients were asked to answer the symptom questions for Criteria B, C, and D retrospectively for a time period when they were not using cannabis, and for a period when they were using it, and scores were recorded for each period. No urine drug screens were collected to verify recent cannabis use.

After conducting over 80 such evaluations between mid-2009 and the end of 2011, all with adults over age 18, CAPS scores were analyzed to assess differences in PTSD symptoms with vs without cannabis use. The null hypothesis was that there would be no significant difference in CAPS scores between the cannabis and no-cannabis conditions.

MATERIALS AND METHODS

Study procedures were approved by the Institutional Review Board (IRB) of the Los Angeles BioMedical Research Institute at Harbor-UCLA Medical Center. Retrospective chart review procedures were conducted for the first 80 patients evaluated by GG for participation in the New Mexico Department of Health's Medical Cannabis Program for PTSD. The data collection procedure began with GG scanning each of the CAPS scoring forms for Criteria B, C, and D to a file in .pdf format. The .pdf files and spreadsheet were then sent to the two other investigators, CG and AH. Per IRB rules, no identifying information was extracted from patient records, or seen or retained by any of the investigators.

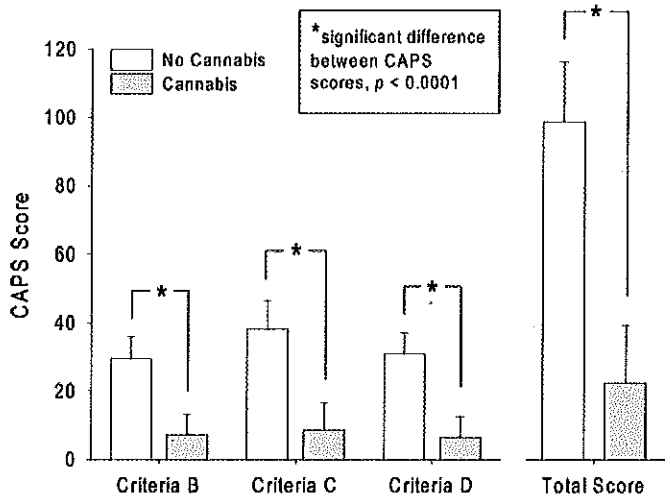
CAPS symptom cluster (re-experiencing, avoidance, and arousal) scores were analyzed using two-way analysis of variance (ANOVA) with time period (no-cannabis vs. cannabis) as a within-subject factor. When the two-way ANOVA detected significant main effects of time period or interactions between time period and symptom cluster, post-hoc pairwise comparisons were performed by one-way ANOVA. CAPS scores in patients using cannabis were also analyzed as %baseline (no-cannabis) scores using two-tailed one-sample t-tests. Statistical significance was demonstrated by surpassing an α level of .01.

In addition to statistically analyzing the Criteria B, C, and D symptom scores, the initial plan was to record whether the patient met diagnostic criteria for PTSD with and without cannabis use. However, no single scoring rule or method of the nine suggested by the CAPS Manual (Weathers, Ruscio & Keane 1999) was appropriate for this study. Determining whether someone has or does not have a PTSD diagnosis based solely on any of the nine CAPS scoring methods would exaggerate the perception of a difference that did not reflect the clinical condition of the person, because the frequency and intensity of all the symptoms exist on a continuum. Therefore, a patient who barely qualified for the diagnosis according to one of the scoring rules/methods would not be very different from someone who almost qualified.

RESULTS

CAPS scores for the no-cannabis and cannabis conditions are shown in Figure 1. Within-subject analysis showed that there was a significant reduction of total CAPS scores ($F(1,79) = 1119.55$, $p < 0.0001$) when patients were using cannabis (22.5 ± 16.9 (mean ± S.D.)) compared with the no-cannabis condition (98.8 ± 17.6). There were also significant reductions in CAPS symptom cluster scores (Cannabis × Cluster: $F(2,158) = 39.87$, $p < 0.0001$) in patients using cannabis. Post-hoc analysis confirmed that scores were reduced during cannabis use for Criterion B (core symptom cluster of re-experiencing), which decreased from 29.5 ± 6.4 to 7.3 ± 5.9 ($F(1,79) = 734.98, p < 0.0001$); Criterion C (numbing and avoidance), which decreased from 38.2 ± 8.4 to 8.7 ± 8.0 ($F(1,79) = 783.73, p < 0.0001$); and Criterion D (hyperarousal), which

FIGURE 1
CAPS Scores for the No-Cannabis and Cannabis Conditions. Data Are Expressed as Group Means ± S.D.
***Significant Difference Between CAPS Scores, $p < 0.0001$.**



decreased from 31.0 ± 6.2 to 6.6 ± 6.0 ($F(1,79) = 910.79$, $p < 0.0001$).

CAPS scores in patients using cannabis were also analyzed as %baseline (no-cannabis) scores. Use of cannabis was associated with a reduction of total CAPS scores to 22.7 ± 15.9% of baseline ($t(79) = -43.48$, $p < 0.0001$); similar reductions occurred in Criterion B (24.8 ± 18.9%; $t(79) = -35.59$, $p < 0.0001$), Criterion C (22.5 ± 19.5%; $t(79) = -35.59$, $p < 0.0001$), and Criterion D (21.0 ± 17.6%; $t(79) = -40.12$, $p < 0.0001$) scores.

One finding was that only 19 of the 80 patients reported any score at all for Criterion C3 (inability to recall an important aspect of the trauma) with no cannabis, and the mean score for C3 was much smaller than the mean scores for the other 16 criteria (main effect of criteria for the no cannabis condition: $F(16,1264) = 43.18$, $p < 0.0001$). As shown in Table 1, post-hoc analysis confirmed that the Criterion C3 values for the no-cannabis time period were significantly different than the values for all other criteria during the same time period.

TABLE 1
DSM IV Criteria B, C, and D Scores During the No-Cannabis Time Period

Criteria	Mean	S.D.	N	Comparison Versus C3
B1	6.7	1.2	80	$F(1,79) = 362.53$, $p < 0.0001$
B2	5.7	2.5	80	$F(1,79) = 123.80$, $p < 0.0001$
B3	4.1	2.9	80	$F(1,79) = 48.62$, $p < 0.0001$
B4	6.5	1.5	80	$F(1,79) = 273.24$, $p < 0.0001$
B5	6.5	1.4	80	$F(1,79) = 279.16$, $p < 0.0001$
C1	6.7	1.7	80	$F(1,79) = 266.72$, $p < 0.0001$
C2	6.5	1.6	80	$F(1,79) = 308.42$, $p < 0.0001$
C3	1.2	2.4	80	
C4	6.2	2.1	80	$F(1,79) = 211.79$, $p < 0.0001$
C5	6.2	2.0	80	$F(1,79) = 229.73$, $p < 0.0001$
C6	5.9	2.3	80	$F(1,79) = 185.00$, $p < 0.0001$
C7	5.6	2.8	80	$F(1,79) = 118.92$, $p < 0.0001$
D1	7.1	1.7	80	$F(1,79) = 339.92$, $p < 0.0001$
D2	5.9	2.2	80	$F(1,79) = 153.62$, $p < 0.0001$
D3	5.9	1.7	80	$F(1,79) = 214.04$, $p < 0.0001$
D4	6.3	2.1	80	$F(1,79) = 221.47$, $p < 0.0001$
D5	5.8	2.0	80	$F(1,79) = 178.75$, $p < 0.0001$

DISCUSSION

Patients in this sample reported over 75% reduction in all three areas of PTSD symptoms while using cannabis. Because this was a highly select group of pre-screened patients who had already found that cannabis reduced their PTSD symptoms and who sought entry to the NM Medical Cannabis Program to avoid criminal penalties for cannabis possession, reports of significant symptom reduction could be expected. Some degree of intentional or unintentional exaggeration of symptom differences on the part of the patients is likely, and some unintentional bias on the part of the psychiatrist conducting the evaluations is also possible.

Another factor is that some patients may have reported their no-cannabis PTSD symptoms when they were also experiencing a cannabis-withdrawal syndrome. Nightmares, anger, and insomnia have been reported as common symptoms of cannabis withdrawal (Allsop et al. 2011). Those three symptoms are among the 17 symptoms of PTSD, and so could have resulted in higher no-cannabis CAPS scores for those symptoms. However, in this retrospective chart review, no information was collected on the length of the time periods without cannabis use. Therefore, there is no valid way to quantify the degree to which cannabis-withdrawal symptoms may have increased the CAPS scores for those three PTSD symptoms. However, even with the above confounding variables, the amount of reported symptom relief is noteworthy.

Furthermore, the variability in scores with cannabis use was relatively high, with the standard deviation being almost equal to the mean total scores and the scores of the three symptom clusters. If patients had consistently reported frequent and severe symptoms without cannabis and almost no symptoms with cannabis in order to make sure they qualified for the Program, one would expect less variability in the cannabis scores. Finally, the relatively consistent reporting of low or "0" scores on Criterion C3 without cannabis (see Table 1) is another indication that most patients were not malingering by exaggerating their no-cannabis scores for every single symptom in order to qualify for the program. In fact, their reporting low scores for this symptom is consistent with psychometric literature on the CAPS: "Finally, with the exception of amnesia, the prevalence of each of the 17 core PTSD symptoms on the CAPS was significantly greater in participants with PTSD than in those without PTSD, indicating robust discrimination between the two groups" (Weathers, Keane & Davidson, 2001).

Because only patients who reported benefit from cannabis in reducing their PTSD were studied, no conclusions can be drawn as to what proportion or type of PTSD patients would benefit from treatment with cannabis or its constituents. The reported anxiolytic properties of cannabidiol may partly explain the reported benefit, though the cannabis in the Israeli study reportedly contained almost no cannabidiol (Mashiah 2012). That small, open-label prospective study comes closer to showing a benefit, at least for people with combat-related PTSD. It has also been reported that the synthetic cannabinoid nabilone can reduce the incidence and severity of nightmares in PTSD patients (Fraser 2009).

The finding that use of cannabis can reduce symptoms of PTSD is consistent with preclinical evidence showing that the endocannabinoid system is involved in the regulation of emotional memory. There is extensive evidence that cannabinoids may facilitate extinction of aversive memories (de Bitencourt, Pamplona & Takahashi 2013). For example, in rodents, the full CB1 receptor agonist WIN 55,212-2 (Pamplona et al. 2006; Pamplona, Bitencourt & Takahashi 2008) and the fatty acid amide hydrolase inhibitor AM404 (Pamplona et al. 2006; Chhatwal et al. 2005) facilitate extinction of conditioned fear. Given the role that the endocannabinoid system plays in fear extinction, it is possible that the marked reduction in PTSD symptomatology reported with cannabis use in the present study was due to facilitated extinction of fear memories. Additional studies are necessary to identify the specific mechanism by which cannabis use attenuates the symptoms of PTSD.

CONCLUSION

Though currently there is no substantial proof of the efficacy of cannabis in PTSD treatment, the data reviewed here supports a conclusion that cannabis is associated with PTSD symptom reduction in some patients, and that a prospective, placebo-controlled study of cannabis or its constituents for treatment of PTSD is warranted.

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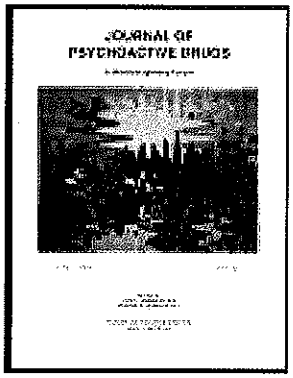

Journal of Psychoactive Drugs
Publication details, including instructions for authors and subscription information:
http://www.tandfonline.com/loi/ujpd20

PTSD Symptom Reports of Patients Evaluated for the New Mexico Medical Cannabis Program

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Published online: 11 Mar 2014.

To cite this article: 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, DOI: 10.1080/02791072.2013.873843

To link to this article: http://dx.doi.org/10.1080/02791072.2013.873843

IS THE GRASS ALWAYS GREENER? AN UPDATED LOOK AT OTHER STATE MEDICAL MARIJUANA PROGRAMS

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Report No. 1, 2014

Legislative Reference Bureau
State Capitol
Honolulu, Hawaii 96813
http://lrbhawaii.org

This report has been cataloged as follows:

Ching, Lance + Brannon, Johnny
Is the grass always greener? An updated look at other state medical marijuana programs. Honolulu, HI: Legislative Reference Bureau, August 2014.

1. Marijuana – Therapeutic use – United States – States – Hawaii. 2. Marijuana – Law and legislation – United States – States – Hawaii.
KFH421.5 L35 A25 14-1

FOREWORD

During the 2000 Regular Session, the Hawaii Legislature enacted the Medical Use of Marijuana law, codified as Part IX of Chapter 329, Hawaii Revised Statutes. Essentially, the medical use of marijuana by qualifying individuals in Hawaii is permitted under certain conditions. However, the law does not provide these individuals with a legal method of obtaining medical marijuana.

Pursuant to Act 29, First Special Session Laws of Hawaii 2009, the Bureau conducted a study on the policies and procedures of other state medical marijuana programs, with regard to issues of access, distribution, and security. In a report submitted in August 2009, the Bureau found that, of the thirteen states that had established medical marijuana programs, only three states had policies and procedures to address these issues. The Bureau further determined that, even in these three states, the policies and procedures were still in a very early stage of development.

This report was undertaken in response to House Concurrent Resolution No. 48, H.D. 2, S.D. 1 (2014). The Bureau was requested to complete and submit to the Medical Marijuana Dispensary System Task Force "an updated report on the policies and procedures for access, distribution, security, and other relevant issues related to the medical use of cannabis in all states that currently have a medical cannabis program[.]"

Charlotte A. Carter-Yamauchi
Acting Director

August 2014

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APPENDIX

EXECUTIVE SUMMARY

History of Hawaii's Medical Marijuana Program

Hawaii was the first state to establish a medical marijuana program by legislation rather than by ballot initiative. Authorized by Act 228, Session Laws of Hawaii 2000. Hawaii's medical marijuana program became effective on June 14, 2000, and is codified as part IX, chapter 329, Hawaii Revised Statutes (HRS). The Department of Public Safety adopted administrative rules to implement the provisions of Act 228 on December 28, 2000.

Current Operating Structure of the Hawaii Medical Marijuana Program

Currently administered by the Department of Public Safety, the Hawaii medical marijuana program affords certain protections to qualifying patients, primary caregivers, and treating physicians by providing that the medical use of marijuana is an affirmative defense to any prosecution involving marijuana, so long as the qualifying patient or primary caregiver has strictly complied with the requirements of the program. Hawaii law also provides that no physician shall be subject to arrest or prosecution, penalized in any manner, or denied any right or privilege for providing written certification for the medical use of marijuana for a qualifying patient so long as the physician strictly complies with the requirements of the program. The cumulative effect of these protections is the decriminalization of medical use of marijuana by qualifying patients.

Under the Hawaii medical marijuana program, the medical use of marijuana by a qualifying patient is permitted only so long as the amount of marijuana possessed does not exceed "an adequate supply," which Hawaii state law presently defines as not more than three mature marijuana plants, four immature marijuana plants, and one ounce of usable marijuana per each mature plant, jointly possessed between a qualifying patient and a primary caregiver.

In order to qualify as a patient under the program, a person must have written certification from a physician, affirming that the person has been diagnosed with a debilitating medical condition and that the potential benefits of the medical use of marijuana would likely outweigh the health risks for the particular qualifying patient.

Qualifying patients and their primary caregivers are required to provide registration information for a confidential patient registry administered by the Department of Public Safety in order to participate in the medical marijuana program. Upon verification of registration information, the Department of Public Safety issues registry identification certificates. Failure to obtain a registry identification certificate would disqualify a patient or caregiver from participating in the medical marijuana program and could render the person subject to criminal prosecution.

Issues that Remain Uncertain Under Hawaii's Medical Marijuana Program

Access to Medical Marijuana

Although the Hawaii medical marijuana program permits qualifying patients to use medical marijuana, it does not provide patients with a method of obtaining marijuana other than by allowing the patient or caregiver to grow a limited amount of marijuana. Under federal law, pharmacies are only permitted to dispense medications that have been prescribed. However, since marijuana is classified under federal law as a Schedule I controlled substance, physicians are not allowed to write prescriptions for its use. Under Hawaii law, a physician does not prescribe marijuana for medical purposes, but merely issues a written certification to a qualifying patient. The law is silent regarding how the qualifying patient is to obtain the marijuana.

Furthermore, while the State's medical marijuana program permits a qualifying patient and primary caregiver to grow marijuana plants for the patient's medical use, the program does not supply marijuana seeds or plants, nor provide a source or means of obtaining them. Nor does the program offer guidance on the cultivation of marijuana. Moreover, the sale of marijuana in any amount is strictly prohibited under state law. As a result, there is no place within the State where a person, even a qualifying patient with a valid registry identification certificate, can legally purchase marijuana.

Transportation of Medical Marijuana in Hawaii

Federal law does not allow for the interstate transportation of medical marijuana, or transportation of medical marijuana through federal security checkpoints. However, as an island state, Hawaii must contend with a layer of potential federal intervention that other states may not otherwise have to contend with when implementing an efficient medical marijuana dispensing program. The vast majority of passengers who travel between Hawaii and other states, or from one of Hawaii's islands to another, do so primarily via commercial passenger aircraft and traverse federal Transportation Security Administration checkpoints located in airports operated by the State of Hawaii. Further, federal authorities have long recognized that the channels between the State's major islands are international waters, and thus, travel by air or sea between those islands constitutes interstate travel, even though the destinations are within a single state. The potential for federal prosecution of Hawaii qualified patients traveling interisland who possess medical marijuana underscores the need for any medical marijuana dispensing strategy developed by the state of Hawaii to recognize and address this concern.

Moreover, Hawaii state law remains unsettled concerning the transportation of medical marijuana outside the home, given the inconsistency in Hawaii law between the definition of "medical use" in section 329-121, HRS, which includes the "transportation of marijuana," and the prohibition on the use of medical marijuana in any "place open to the public" under section 329-122(c)(2)(E), HRS. In 2013, the Hawaii Supreme Court overturned a qualifying patient's conviction for promoting a detrimental drug in the third degree, in relation to his possession of medical marijuana in a public place, but emphasized that the decision applied only to the specific facts and circumstances of that case. The court held that there was an "irreconcilable

inconsistency between the authorized transportation of medical marijuana under HRS § 329-121, and the prohibition on transport of medical marijuana through 'any . . . place open to the public' under HRS § 329-122(c)(E)." Thus, under the rule of lenity, the defendant was entitled to an affirmative defense and a judgment of acquittal. The court explicitly did not address whether other circumstances, including other locations or modes of transportation, may similarly trigger the rule of lenity, which strictly construes an ambiguous statute against the government and in favor of the accused. However, the court noted that Hawaii's medical marijuana laws do not explicitly provide for how medical marijuana would initially arrive at the qualifying patient's home, nor provide for its possession outside the home, even though "qualifying patients, like other ordinary people, may be absent from the home" for legitimate purposes.

Thus, at present, it is uncertain whether or to what extent a Hawaii qualifying patient or caregiver may transport medical marijuana anywhere outside the home, even when limited to travel within the same island, without violating state drug enforcement laws. The inconsistency between sections 329-121 and 329-122, HRS, presently presents an impediment to an effective medical marijuana distribution system in Hawaii and would need to be addressed if the State is to implement a distribution system.

Recent Developments in Hawaii's Medical Marijuana Laws

During the Regular Session of 2013, two laws were enacted that will have a significant effect on Hawaii's medical marijuana program commencing in January 2015.

Act 177, Session Laws of Hawaii 2013

Act 177, Session Laws of Hawaii 2013, implements the 2009 Medical Cannabis Working Group's recommendation to transfer the administration of Hawaii's medical marijuana program from the Department of Public Safety to the Department of Health no later than January 1, 2015.

Act 178, Session Laws of Hawaii 2013

Aside from making various technical as well as conforming amendments that address the transfer of administration of the medical marijuana program to the Department of Health in 2015, the most significant amendment to the Hawaii medical marijuana program included in Act 178, Session Laws of Hawaii 2013, is that, beginning January 2, 2015, the definition of "adequate supply" will change from "three mature marijuana plants, four immature marijuana plants, and one ounce of usable marijuana per each mature plant" to "seven marijuana plants, whether immature or mature, and four ounces of usable marijuana at any given time."

No One "Model" Program

Twenty-three states have medical marijuana programs: Alaska, Arizona, California, Colorado, Connecticut, Delaware, Hawaii, Illinois, Maine, Maryland, Massachusetts, Michigan, Minnesota, Montana, Nevada, New Hampshire, New Jersey, New Mexico, New York, Oregon, Rhode Island, Vermont, and Washington. As would be expected, there are some issues or program characteristics that all or nearly all of the states with medical marijuana programs have addressed in one fashion or another. Exactly how they have addressed these issues or characteristics likely depends in large part upon a number of factors, which may include the size of their medical marijuana patient population, whether the majority of their population lives in urban or rural areas, whether distance from or access to medical marijuana is an issue, support for such programs within the state's population and among its decision-makers, what is politically feasible at the time the program is established, and other factors that may be peculiar to a particular state.

As a result, there are many similarities, as well as many differences, among the various states' medical marijuana programs. Accordingly, there does not appear to be any one model that can be touted as an exemplary program that all states should follow. Moreover, while many states have established medical marijuana programs, some of these are relatively new, and the programs, or aspects of the program such as the distribution systems, are not yet operational. For example, while eighteen states provide for distribution systems, only eight states (Arizona, California, Colorado, Maine, New Jersey, New Mexico, Rhode Island, and Vermont) have operational distribution systems. Further, it should be noted that many of the earlier states to adopt medical marijuana programs did not provide for distribution systems at that time. Thus only a few states have much of a track record concerning programmatic aspects of a medical marijuana distribution system and such concomitant issues as those relating to cultivation, access, safety, security, etc. That said, some general observations and conclusions about the states' medical marijuana programs may be made.

General Program Characteristics of State Medical Marijuana Programs

All states with medical marijuana programs:

(1) Provide for the removal of state-level criminal penalties for the use of marijuana for medical purposes;

(2) Require that qualifying patients be certified by a physician as having a medical condition that would benefit from the medical use of marijuana; and

(3) Specify the maximum amount of medical marijuana that a qualifying patient and caregiver may possess.

Finally, nearly all of the state programs, with the exception of Washington, have confidential patient registries that are administered by a state agency.

Access to Medical Marijuana

Of the twenty-three states that have medical marijuana programs, fifteen (Alaska, Arizona, California, Colorado, Hawaii, Maine, Massachusetts, Michigan, Montana, Nevada, New Mexico, Oregon, Rhode Island, Vermont, and Washington) allow qualifying patients to cultivate marijuana, under certain conditions, and eighteen (Arizona, California, Colorado, Connecticut, Delaware, Illinois, Maine, Maryland, Massachusetts, Minnesota, Nevada, New Hampshire, New Jersey, New Mexico, New York, Oregon, Rhode Island, and Vermont) incorporate some form of distribution system into their programs. Further, ten (Arizona, California, Colorado, Maine, Massachusetts, Nevada, New Mexico, Oregon, Rhode Island, and Vermont) of the twenty-three states appear to both allow patients to cultivate marijuana and provide for medical marijuana dispensaries.

Regulation of Distribution Systems

Of the eighteen states with some form of medical marijuana distribution system, seventeen states (with the exception of California) provide for statewide regulation of the distribution systems. In a majority of these states (Arizona, Delaware, Maine, Massachusetts, Minnesota, Nevada, New Hampshire, New Jersey, New Mexico, New York, Oregon, and Rhode Island), the entity responsible for regulation is the state health agency. In a different mix of a majority of states (Arizona, Delaware, Illinois, Maine, Massachusetts, Minnesota, Nevada, New Hampshire, New York, Oregon, Rhode Island, and Vermont), the regulation takes the form of a registration requirement. In other states, regulation is through a licensure (Colorado, Connecticut, Maryland, and New Mexico) or permit (New Jersey) requirement. In yet a differing majority of these states (Arizona, Colorado, Delaware, Maine, Massachusetts, Minnesota, New Hampshire, New Jersey, New Mexico, New York, Rhode Island, and Vermont), the same regulated third party entity may both cultivate and dispense medical marijuana.

Common Elements of Statewide Distribution Systems

Other issues or program characteristics generally considered by the states with medical marijuana programs that provide for some type of statewide distribution systems, and ways the majority of states have addressed these issues or characteristics, are as follows:

- **Fees and Taxes**

  All seventeen of these states impose one or more operational fees, at widely varying amounts, on medical marijuana cultivation centers and dispensaries, and most (with the exception of Massachusetts, Minnesota, New Hampshire, Oregon, and Vermont) also impose various state or local taxes on the sale of medical marijuana.

- **Training and Educational Requirements**

  The majority of these states (with the exception of Illinois, Maryland, and New York) appear to have incorporated some level of training requirements for medical marijuana dispensary staff, and most (with the exception of Colorado, Maryland, Minnesota, and Oregon) also require that certain educational information be provided to patients.

- **Labeling**

  Most states (with the exception of Maryland) have also adopted some form of labeling requirement for medical marijuana products; however, these requirements differ widely among the states.

- **Quality Control**

  At least eleven of the seventeen states (Colorado, Connecticut, Delaware, Illinois, Maine, Minnesota, Nevada, New Hampshire, New Mexico, New York, and Oregon) have statutory provisions that address quality control to some extent. Of these, nine states (Colorado, Delaware, Illinois, Maine, Minnesota, Nevada, New Mexico, New York, and Oregon) have provisions that involve marijuana testing.

- **Quantity Control**

  The majority of states (with the exception of Colorado, New Mexico, and Oregon) also appear to generally control the supply of medical marijuana by establishing either minimum or maximum limits on the number of cultivation centers or dispensaries that may be operated in the state. Further, nearly half of the states (Colorado, Maine, New Hampshire, New Jersey, New Mexico, Oregon, Rhode Island, and Vermont) provide for a limitation on the inventory of cultivation centers or dispensaries.

  The majority of the seventeen states (with the exception of Maryland and New Mexico) also limit the amounts of medical marijuana that dispensaries may provide to patients, which generally coincide with, or at least prevent exceeding, a patient's legal possession limits. Finally, the statutes in a number of states (Colorado, Delaware, Illinois, Maine, Nevada, New Hampshire, Rhode Island, and Vermont) also provide that a patient may only obtain marijuana from a particular dispensary if that dispensary has been designated by the patient.

- **Limits on Channels of Supply and Distribution**

  The regulatory statutes of all seventeen states establish controls on the channels of supply and distribution of medical marijuana. Generally, these statutes establish a closed circuit in which medical marijuana circulates only among cultivation centers, dispensaries, patients, and their caregivers. To this end, the majority of states

(Arizona, Connecticut, Delaware, Illinois, Maine, Massachusetts, Minnesota, Nevada, New Hampshire, New York, Rhode Island, and Vermont) place restrictions on the cultivation site by specifying that the cultivation center may cultivate marijuana only in an enclosed, locked facility, and nearly half of these states (Arizona, Delaware, Illinois, Maine, Nevada, New Hampshire, and Vermont) also require that access to the facility be restricted.

To maintain this closed circuit, a number of states (Arizona, Connecticut, Delaware, Illinois, Maine, Nevada, New Mexico, Oregon, and Vermont) also limit the external sources from which cultivation centers or dispensaries may obtain medical marijuana that they themselves do not cultivate; these permissible sources include other dispensaries, other cultivation centers, or patients or their caregivers.

The states also limit the entities to whom medical marijuana may be distributed. All seventeen states specify that a dispensary may distribute medical marijuana to two entities -- a patient or the patient's caregiver. Ten of these states (Connecticut, Illinois, Maine, Maryland, Massachusetts, Minnesota, New Jersey, Oregon, Rhode Island, and Vermont) limit distribution to only those two entities. Another six states (Arizona, Colorado, Nevada, New Hampshire, New Mexico, and New York) also permit a dispensary to distribute medical marijuana to another dispensary.

- **Security Requirements**

  Finally, all seventeen states require their cultivation centers and dispensaries to comply with various security requirements. These requirements range from as simple as installing a functional security alarm, to requiring facilities to meet certain design specifications. The majority of states (with the exception of Maryland, Minnesota, New Mexico, New York, and Rhode Island) require, at minimum, installation of an alarm system and video surveillance of the premises, and most states (with the exception of Maryland, New Mexico, and New York) impose various additional security requirements.

Medical Marijuana Programs Resist Simple Categorization

There may be a tendency to want to categorize medical marijuana programs along artificial lines (such as restrictive or nonrestrictive programs) in order to better grasp the similarities and differences of programs established by other states. The reader is cautioned against such an attempted approach, however, given the wide variation in how states have addressed the issues and program characteristics in establishing their medical marijuana programs. Such an approach would seem too simplistic and would ignore significant nuances of each state's program.

Limited Access Marijuana Product Laws

In addition to the twenty-three states with medical marijuana programs, eleven other states have enacted limited access marijuana product laws over the past year that make provision for the use of certain strains of marijuana for limited medical or research purposes. While not as comprehensive as more traditional medical marijuana programs, these limited access laws have the attraction of focusing on strains of marijuana that have little or no psychoactive effects. As a result, an increasing number of states have shown interest in pursuing similar laws.

Federal Position on the Medical Use of Marijuana

Controlled Substances Act

The Controlled Substances Act, enacted by the United States Congress in 1970, is the basis for federal drug policy under which the manufacture, use, possession, and distribution of certain substances is regulated. The Controlled Substances Act classifies marijuana as a Schedule I substance, which means that the federal government considers marijuana to have a high potential for abuse and no currently accepted medical use in treatment in the United States.

United States Department of Justice Guidelines

On October 19, 2009, the United States Department of Justice issued a memorandum that advised federal prosecutors in states with medical marijuana programs to refrain from pursuing cases against individuals for marijuana offenses that did not violate state medical marijuana laws.

In a subsequent memorandum issued on August 29, 2013, the Department of Justice clarified its position on marijuana by enumerating specific nationwide enforcement priorities and noted that it has not historically devoted resources to prosecuting individuals whose conduct is limited to possession of small amounts of marijuana for personal use on private property and that it has generally left enforcement to state and local authorities unless the marijuana-related activities run afoul of the enumerated enforcement priorities.

The Department of Justice indicated that it is inclined to defer to state and local enforcement in states that authorize the production, distribution, and possession of medical marijuana, provided the affected states implement strong and effective regulatory and enforcement systems that will address the threat those state laws could pose to public safety, public health, and other law enforcement interests. However, the 2013 memorandum also warned that states that enact marijuana legalization schemes but fail to implement them effectively could be subject to federal intervention.

United States Department of the Treasury Guidelines

Marijuana-related businesses have complained that federal marijuana prohibitions, combined with federal requirements regarding financial institutions, block their access to banking and credit card services and limit them to cash transactions that raise security concerns. Banks have also raised concerns that providing services to marijuana-related businesses could subject them to federal penalties. These combined concerns resulted in medical marijuana-related businesses being unable to deposit revenues from their businesses into financial institutions.

Given these concerns, the United States Department of the Treasury issued a memorandum on February 14, 2014, to clarify Bank Secrecy Act expectations for financial institutions, such as banks, that seek to provide services to medical marijuana-related businesses.

The Treasury memorandum establishes guidelines to clarify and streamline federally-required reporting requirements for financial institutions seeking to provide financial services to medical marijuana-related businesses. The Treasury memorandum provides guidance on how to indicate whether or not the marijuana-related business raises suspicion of any illegal activity, other than a violation of the federal prohibitions against marijuana, or any activity that implicates any of the Department of Justice's enforcement priorities regarding marijuana.

Recent Federal Developments

Pending Legislation

There do not appear to be any strong indications that the United States Congress will approve the legalization of marijuana for medical purposes in the near future. However, it is possible that Congress will prohibit certain federal spending on enforcement that interferes with state implementation of laws authorizing the use of medical marijuana, which could effectively curtail federal enforcement.

The United States House of Representatives has approved an amendment to an appropriations bill that would, if approved by the Senate and the President, prohibit the United States Department of Justice from spending federal funds in federal fiscal year 2015 to prevent states from implementing state laws that authorize the use, distribution, possession, or cultivation of marijuana for medical purposes. It should be noted that, as currently drafted, the measure would not explicitly preclude federal enforcement of prohibitions against marijuana despite state legalization schemes and could therefore be subject to interpretation. Also, the measure would not affect federal spending for such purposes in subsequent years.

Proposed Legislation

In addition to the pending legislation discussed above, other bills or amendments to existing bills have recently been proposed. For example, on July 24, 2014, an amendment was proposed to a bill being heard by the United States Senate that would recognize the right of states to enact laws that authorize the use, distribution, possession, or cultivation of marijuana for medical use.

On July 28, 2014, a bill was introduced to the United States House of Representatives that would remove therapeutic hemp and cannabidiol from the definition of marijuana in the Controlled Substances Act. If enacted, most strains of marijuana would still be prohibited under federal law. However, strains of marijuana with extremely low THC concentrations and cannabidiol oil would effectively become legal on a national basis.

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Chapter 1

INTRODUCTION

State Medical Marijuana Programs

House Concurrent Resolution No. 48, H.D. 2, S.D. 1 (2014) (hereinafter "Resolution") -- the measure to which this report responds -- is attached as Appendix A. Specifically, the Resolution directs the Bureau to "report on the policies and procedures for access, distribution, security, and other relevant issues related to the medical use of cannabis in all states that currently have a medical cannabis program[.]"

Scope of the Study

Colorado and Washington have enacted laws that effectively legalize the possession and use of marijuana by people within those states who are twenty-one years of age or older. However, since the Resolution directs the Bureau to report on *medical marijuana* programs, other programs, such as *"recreational marijuana"* or *"retail marijuana"* programs, are not addressed by this study.

Organization of the Study

Chapter 2 reviews the policies and procedures of the Hawaii medical marijuana program. Chapter 3 provides a general overview of the medical marijuana programs of other states. Chapter 4 examines the policies and procedures of states that currently have or are developing systems for distribution of medical marijuana. Chapter 5 discusses the federal government's position regarding state medical marijuana programs. Chapter 6 presents a brief summary.

Chapter 2

HAWAII MEDICAL MARIJUANA PROGRAM

Establishment of the Hawaii Medical Marijuana Program

Hawaii was the first state to establish a medical marijuana program by legislation rather than by ballot initiative.[1] Hawaii's medical marijuana program was authorized by Act 228, Session Laws of Hawaii 2000. Act 228 became effective on June 14, 2000, and is codified as part IX, chapter 329, Hawaii Revised Statutes (HRS) (entitled "Medical Use of Marijuana"). The Department of Public Safety adopted administrative rules to implement the provisions of Act 228 on December 28, 2000.[2]

Current Operating Structure of the Hawaii Medical Marijuana Program

Currently administered by the Department of Public Safety, the Hawaii medical marijuana program affords certain protections to qualifying patients, primary caregivers, and treating physicians. Specifically, section 329-125, HRS, provides that a qualifying patient or the primary caregiver of a qualifying patient may assert the medical use of marijuana as an affirmative defense to any prosecution involving marijuana, so long as the qualifying patient or primary caregiver has strictly complied with the requirements of the program. Similarly, section 329-126, HRS, provides that "[n]o physician shall be subject to arrest or prosecution, penalized in any manner, or denied any right or privilege for providing written certification for the medical use of marijuana for a qualifying patient[,]" so long as the physician strictly complies with the requirements of the program. The cumulative effect of these protections is the removal of state-level criminal penalties for the medical use of marijuana by qualifying patients.

Section 329-121, HRS, defines "medical use" as "the acquisition, possession, cultivation, use, distribution, or transportation of marijuana or paraphernalia relating to the administration of marijuana to alleviate the symptoms or effects of a qualifying patient's debilitating medical condition." A qualifying patient is generally allowed to select a primary caregiver, a person of at least eighteen years of age who agrees to undertake the responsibility for managing the well-being of the qualifying patient with respect to the medical use of marijuana.[3] Section 329-121, HRS, also states that "[f]or the purposes of 'medical use', the term distribution is limited to the transfer of marijuana and paraphernalia from the primary caregiver to the qualifying patient."

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[1] Alaska, California, Maine, Oregon, and Washington established medical marijuana programs by ballot initiative prior to the enactment of Hawaii's Act 228.

[2] Although the Hawaii medical marijuana program is currently administered by the Department of Public Safety, the program will be transferred to the Department of Health, beginning January 1, 2015. *See* discussion of Recent Developments, *infra*.

[3] In the case of a minor or an adult lacking legal capacity, the primary caregiver shall be a parent, guardian, or person having legal custody. Section 329-121, Hawaii Revised Statutes (HRS).

Under section 329-122, HRS, the medical use of marijuana by a qualifying patient is permitted only so long as the amount of marijuana does not exceed an "adequate supply," which restricts the amount of marijuana jointly possessed between a qualifying patient and a primary caregiver to "not more than is reasonably necessary to assure the uninterrupted availability of marijuana for the purpose of alleviating the symptoms or effects of a qualifying patient's debilitating medical condition[.]"[4] Specifically, this amount must not exceed "three mature marijuana plants, four immature marijuana plants, and one ounce of usable marijuana per each mature plant."[5]

In order to qualify as a patient under the program, a person must have written certification from a physician, affirming that the person has been diagnosed with a debilitating medical condition and that "the potential benefits of the medical use of marijuana would likely outweigh the health risks for the particular qualifying patient[.]"[6] Section 329-126, HRS, requires a certifying physician to:

(1) Diagnose the patient as having a debilitating medical condition;

(2) Explain the potential risks and benefits of the medical use of marijuana;

(3) Complete a full assessment of the patient's medical history and current medical condition, in the course of a bona fide physician-patient relationship; and

(4) Register information regarding patients who have been issued written certifications with the Department of Public Safety.

Section 329-121, HRS, defines the term "debilitating medical condition" as:

(1) Cancer, glaucoma, positive status for human immunodeficiency virus, acquired immune deficiency syndrome, or the treatment of these conditions;

(2) A chronic or debilitating disease or medical condition or its treatment that produces one or more of the following:

(A) Cachexia or wasting syndrome;

(B) Severe pain;

(C) Severe nausea;

(D) Seizures, including those characteristic of epilepsy; or

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[4] *Id.*

[5] *Id. See also* discussion of Act 178, Session Laws of Hawaii 2013, *infra*.

[6] Section 329-122, HRS.

(E) Severe and persistent muscle spasms, including those characteristic of multiple sclerosis or Crohn's disease; or

(3) Any other medical condition approved by the Department of Health pursuant to administrative rules in response to a request from a physician or potentially qualifying patient.

Qualifying patients and their primary caregivers are required to provide registration information for a confidential patient registry administered by the Department of Public Safety in order to participate in the medical marijuana program.[7] Upon verification of registration information, the Department of Public Safety issues registry identification certificates. Failure to obtain a registry identification certificate would disqualify a patient or caregiver from participating in the medical marijuana program and could render the person subject to criminal prosecution.

Issues that Remain Uncertain Under Current State Law

Distribution of Medical Marijuana

Although the Hawaii medical marijuana program permits qualifying patients to use medical marijuana, it does not provide patients with a method of obtaining marijuana other than by allowing the patient or caregiver to grow the marijuana. Qualifying patients cannot simply have a prescription for medical marijuana filled at a pharmacy. Under federal law, pharmacies are only permitted to dispense medications that have been prescribed. However, since marijuana is classified under federal law as a Schedule I controlled substance, physicians are not allowed to write prescriptions for its use. Under Hawaii law, a physician does not prescribe marijuana for medical purposes, but merely issues a written certification to a qualifying patient. The law is silent regarding how the qualifying patient is to obtain the marijuana.

Furthermore, while the State's medical marijuana program permits a qualifying patient and primary caregiver to grow marijuana plants for the patient's medical use, the program does not supply marijuana seeds or plants, nor provide a source or means of obtaining them. Nor does the program offer guidance on the cultivation of marijuana. Moreover, the sale of marijuana in any amount is strictly prohibited under state law.[8] As a result, there is no place within the State where a person, even a qualifying patient with a valid registry identification certificate, can legally purchase marijuana.

After careful review of Hawaii's medical marijuana program, as codified under part IX of chapter 329, HRS (the Uniform Controlled Substances Act), and administered under chapter 23-202, Hawaii Administrative Rules, it appears that current state law is essentially silent with regard to issues of access, distribution, and security related to the medical use of marijuana.

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[7] Section 23-202-10, Hawaii Administrative Rules (HAR).
[8] Section 712-1247, HRS.

Transportation of Medical Marijuana

Hawaii law is unsettled with regard to the circumstances in which a qualifying patient or primary caregiver may legally possess or transport medical marijuana outside the home.

In 2013, the Hawaii Supreme Court overturned a qualifying patient's conviction for promoting a detrimental drug in the third degree, in relation to his possession of medical marijuana in a public place, but emphasized that the decision applied only to the specific facts and circumstances of that case.[9]

The case centered on the defendant's possession of marijuana in the Kona International Airport.[10] The parties stipulated that the marijuana was medical marijuana and that the defendant possessed a valid medical marijuana certificate. However, the State argued that the statutory prohibition on medical use of marijuana in public places, found in section 329-122(c)(2)(E), HRS, should be strictly construed to include strict prohibition on the transportation of medical marijuana, since "medical use" is defined in section 329-121, HRS, to include transportation of marijuana. The court held that "there is an irreconcilable inconsistency between the authorized transportation of medical marijuana under HRS § 329-121, and the prohibition on transport of medical marijuana through 'any . . . place open to the public' under HRS § 329-122(c)(E)" and that, under the rule of lenity, the defendant was entitled to an affirmative defense and a judgment of acquittal.[11]

The court explicitly did not address whether other circumstances, including other locations or modes of transportation, may similarly trigger the rule of lenity, which strictly construes an ambiguous statute against the government and in favor of the accused. However, the court noted that Hawaii law "makes no provision for how medical marijuana would even arrive at the qualifying patient's home,"[12] and "makes no provision for its possession outside the home, even though qualifying patients, like other ordinary people, may be absent from the home for many hours at a time; travel for extended periods of time; move residences; reside in more than one residence; evacuate their homes during emergencies like tsunami warnings, floods, and fires; and become homeless."[13] The court observed that "the lack of clarity in the statute is apparent" when considering what type of transport of marijuana would be legally permissible if transport cannot occur in a public place. Because such statutory construction would produce an "absurd result," the court concluded that "[t]his reading of HRS § 329-125's strict compliance *results in an impracticality the legislature could not have intended.*"[14]

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[9] *See State v. Woodhall*, 129 Hawaii 397, 301 P.3d 607 (2013).

[10] The marijuana was discovered at a Transportation Security Administration checkpoint, but there was no federal prosecution.

[11] *Woodhall*, 129 Hawaii at 410, 301 P.3d at 620.

[12] *Woodhall*, 129 Hawaii at 407, 301 P.3d at 617.

[13] *Id.*

[14] *Id.* at 409, 301 P.3d at 619 (emphasis added). The court's review of the legislative history surrounding Act 228, Session Laws of Hawaii 2000, establishing Hawaii's medical marijuana program, reveals that this issue was discussed at length, but not resolved. ("This legislative history reveals that even as Act 228 became law, many of the details were left to future legislative action but remain unclear over a decade later.") *Id.*

In a concurring and dissenting opinion, Chief Justice Mark E. Recktenwald agreed that it would be "absurd" to construe the statute to prohibit *all* transportation of medical marijuana in public places, as it would provide no mechanism for a patient to *initially* obtain or transport it, but he argued that there was no indication that the legislature intended to allow a patient to transport medical marijuana outside the home *after* obtaining an initial supply.[15]

The effective implementation of a medical marijuana distribution system in Hawaii will require resolution of this issue.

Recent Developments

During the Regular Session of 2013, two laws were enacted that will have a significant effect on Hawaii's medical marijuana program.

Act 177, Session Laws of Hawaii 2013

In October 2009, the Medical Cannabis Working Group (Working Group) was convened to examine Hawaii's medical marijuana program. In a report submitted to the Legislature in February 2010, the Working Group made several recommendations to improve the program -- four of which were designated as being of the highest priority. One of the recommendations that the Working Group considered to be of the highest priority was that oversight of Hawaii's medical marijuana program should be transferred from the Department of Public Safety to the Department of Health.[16] The Working Group believed that medical marijuana should be treated primarily as an issue of public health and expressed the view that law enforcement agencies, such as the Department of Public Safety, tend to have "little or no expertise in horticultural, health and medical affairs."[17] As a result, the Working Group concluded that the Department of Health was the agency best suited to administer Hawaii's medical marijuana program.

Act 177, Session Laws of Hawaii 2013, implements the Working Group's recommendation by, among other things, requiring that administration of Hawaii's medical marijuana program be transferred from the Department of Public Safety to the Department of Health and establishing a time frame for the transfer. Pursuant to Act 177, "[n]o later than January 1, 2015, all rights, powers, functions, and duties of the department of public safety relating to the medical use of marijuana under part IX of chapter 329, Hawaii Revised Statutes, shall be transferred to the department of health."[18]

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[15] *See Woodhall,* 129 Hawaii at 411-13, 301 P.3d at 621-23 (Recktenwald, C. J., concurring and dissenting).

[16] The Medical Cannabis Working Group also included the following in its list of recommendations that it considered to be of the highest priority: (1) creating a distribution system for medical marijuana; (2) increasing the allowable number of plants and usable marijuana per qualifying patient; and (3) allowing caregivers to care for at least five qualifying patients.

[17] Medical Cannabis Working Group, *Report to the Hawaii State Legislature*, 19 (February 2010).

[18] Section 4(a) of Act 177, Session Laws of Hawaii 2013.

Act 178, Session Laws of Hawaii 2013

Act 178, Session Laws of Hawaii 2013, makes various amendments to Hawaii's medical marijuana law, as codified in part IX, chapter 329, HRS. These include several technical amendments, as well as conforming amendments that address the transfer of administration of the medical marijuana program to the Department of Health. Beyond these amendments, the change that will have the most significant impact on the medical marijuana program is that, beginning January 2, 2015, the definition of "adequate supply" will change from "three mature marijuana plants, four immature marijuana plants, and one ounce of usable marijuana per each mature plant" to "seven marijuana plants, whether immature or mature, and four ounces of usable marijuana at any given time."[19]

It should be noted that neither Act 177 nor Act 178 addresses the underlying inconsistency in Hawaii law with respect to the transportation of medical marijuana in public places.[20]

[19] Section 2 of Act 178, Session Laws of Hawaii 2013, and section 329-121, HRS.
[20] *See* notes 9-15, *supra*, and accompanying text.

Chapter 3

MEDICAL MARIJUANA USE IN OTHER STATES

Medical Marijuana Programs

Twenty-three states and the District of Columbia have established programs to legalize the use of marijuana for medical purposes. In addition to Hawaii, the twenty-two other states with medical marijuana programs are Alaska, Arizona, California, Colorado, Connecticut, Delaware, Illinois, Maine, Maryland, Massachusetts, Michigan, Minnesota, Montana, Nevada, New Hampshire, New Jersey, New Mexico, New York, Oregon, Rhode Island, Vermont, and Washington.

The medical marijuana programs of the other states generally approach the issue in a manner similar to the Hawaii medical marijuana program. Like the Hawaii program, the programs of the other states remove state-level criminal penalties for the use of marijuana for medical purposes. All the state programs require that qualifying patients be certified by a physician as having a medical condition that would benefit from the medical use of marijuana. While the lists of actual qualifying medical conditions vary from state to state, each state program specifies the conditions that qualify for legal protection.[1] Each state program also specifies the maximum amount of medical marijuana a qualifying patient and caregiver may possess. Finally, nearly all of the state programs establish, either by statute or administrative rule, confidential patient registries that are administered by a state agency -- often that state's agency responsible for health.[2] These agencies usually issue identification cards to qualifying patients and caregivers who have registered with their state's medical marijuana program.

The following table summarizes major policy components of the medical marijuana programs in the twenty-three states.[3] As the table below indicates, out of the twenty-three states with medical marijuana programs, only five states (Alaska, Hawaii, Michigan, Montana, and Washington) do not provide qualifying patients with a method of obtaining medical marijuana. This demonstrates a marked increase in medical marijuana programs that incorporate some form of distribution system.[4] In 2009, of the thirteen states that had medical marijuana programs, only

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[1] Each state has its own list of medical conditions that qualify for legal protection under its respective medical marijuana program. Generally, qualifying medical conditions tend to include chronic or debilitating diseases as well as conditions that involve seizures, muscle spasticity, chronic pain, or severe nausea. Many states also provide that medical conditions not specifically included in their programs' list of qualifying medical conditions may still qualify for legal protection if approved by the appropriate state agency.

[2] Washington appears to be the only state that has not provided for some type of patient registry, although the registries in six states (Illinois, Maryland, Massachusetts, Minnesota, New Hampshire, and New York) are not yet operational. *See* note 10, *infra*.

[3] Although the District of Columbia has established a medical marijuana program, it is not included on this table because the focus is on state medical marijuana programs.

[4] It should be noted that many of these states have established their medical marijuana programs recently and thus have not had sufficient time to implement their distribution systems. As a result, only eight states (Arizona, California, Colorado, Maine, New Jersey, New Mexico, Rhode Island, and Vermont) currently have operational distribution systems. *See* note 8, *infra*.

three states (California, New Mexico, and Rhode Island) made provisions for a system of distribution to allow qualifying patients to obtain medical marijuana safely and legally.

Table 3-1

MEDICAL MARIJUANA PROGRAMS:
MAJOR POLICY COMPONENTS

State and Year Established	Removes State-Level Criminal Penalties?	Establishes Patient Registry and Issues ID Cards?	Accepts Other States' Registry ID Cards?	Maximum Marijuana Amount Allowed	Allows Qualifying Patients to Cultivate Marijuana?	Allows Dispensaries?
Alaska (1998)	Yes	Yes	No	1 ounce, 6 plants (up to 3 mature plants)	Yes	No
Arizona (2010)	Yes	Yes	Yes[5]	2.5 ounces, 12 plants	Yes[6]	Yes
California (1996)	Yes	Yes	No	8 ounces, 6 mature plants (or 12 immature plants)	Yes	Yes
Colorado (2000)	Yes	Yes	No	2 ounces, 6 plants (up to 3 mature plants)	Yes	Yes
Connecticut (2012)	Yes	Yes	No	One-month supply[7]	No	Yes[8]
Delaware (2011)	Yes	Yes	No	6 ounces	No	Yes[8]
Hawaii (2000)	Yes	Yes	No	3 ounces, 7 plants (3 mature, 4 immature)[9]	Yes	No
Illinois (2013)	Yes	Yes[10]	No	2.5 ounces per 14-day period	No	Yes[8]

[5] Accepts out-of-state registry identification cards, but does not allow out-of-state patients to obtain marijuana from in-state dispensaries. *See* discussion of Reciprocity, *infra*.
[6] Home cultivation is allowed if residence is further than twenty-five miles from a state-licensed dispensary.
[7] Amount determined by the state Department of Consumer Protection.
[8] Although state law provides for a dispensary system, the dispensaries are not yet operational.
[9] Effective January 2, 2015, the definition of "adequate supply" will change to four ounces and seven plants (regardless of whether the plants are mature or immature). *See* section 329-121, Hawaii Revised Statutes.
[10] Although state law calls for the establishment of a patient registry and the issuance of identification cards, this system is not yet operational.

State and Year Established	Removes State-Level Criminal Penalties?	Establishes Patient Registry and Issues ID Cards?	Accepts Other States' Registry ID Cards?	Maximum Marijuana Amount Allowed	Allows Qualifying Patients to Cultivate Marijuana?	Allows Dispensaries?
Maine (1999)	Yes	Yes	Yes[5]	2.5 ounces, 6 mature plants	Yes	Yes
Maryland (2014)	Yes	Yes[10]	No	30-day supply[11]	No	Yes[8]
Massachusetts (2012)	Yes	Yes[10]	Unknown	60-day supply (10 ounces)	Yes[12]	Yes[8]
Michigan (2008)	Yes	Yes	Yes	2.5 ounces, 12 plants	Yes	No
Minnesota (2014)	Yes	Yes[10]	No	30-day supply of non-smokable marijuana	No	Yes[8]
Montana (2004)	Yes	Yes	No	1 ounce, 4 mature plants, 12 seedlings	Yes	No
Nevada (2000)	Yes	Yes	No	2.5 ounces per 14-day period, 12 plants	Yes[13]	Yes[8]
New Hampshire (2013)	Yes	Yes[10]	Yes[14]	2 ounces	No	Yes[8]

[11] Amount to be determined by the Natalie M. LaPrade Medical Marijuana Commission.

[12] During the period that the Massachusetts Department of Public Health implements its medical marijuana program, qualifying patients are permitted to cultivate a limited supply of marijuana sufficient to maintain a sixty-day supply. State law also authorizes the Department of Public Health to issue "hardship cultivation registrations" to qualifying patients who have limited access to a medical marijuana treatment center.

[13] Home cultivation is prohibited if a medical marijuana dispensary opens in the county where a qualifying patient or primary caregiver resides. However, this prohibition does not apply if:

(1) The dispensary is unable to produce the strain of marijuana necessary to treat the qualifying patient's specific medical condition;
(2) The qualifying patient or primary caregiver is unable to reasonably travel to a dispensary; or
(3) No dispensary was operating with twenty-five miles of the qualifying patient at the time the qualifying patient first applied for a registry identification card.

Also, qualifying patients or primary caregivers who were cultivating medical marijuana, in compliance with state law, prior to July 1, 2013, may continue to do so until March 31, 2016. *See* Section 453A.200, Nevada Revised Statutes.

[14] New Hampshire recognizes registry identification cards from out-of-state qualifying patients, provided that the qualifying patient has written certification of a qualifying medical condition recognized under New Hampshire law. Even so, out-of-state qualifying patients are not allowed to purchase or grow marijuana in New Hampshire. *See* discussion of Reciprocity, *infra.*

State and Year Established	Removes State-Level Criminal Penalties?	Establishes Patient Registry and Issues ID Cards?	Accepts Other States' Registry ID Cards?	Maximum Marijuana Amount Allowed	Allows Qualifying Patients to Cultivate Marijuana?	Allows Dispensaries?
New Jersey (2010)	Yes	Yes	No	2 ounces	No	Yes
New Mexico (2007)	Yes	Yes	No	6 ounces, 4 mature plants, 12 seedlings	Yes	Yes
New York (2014)	Yes	Yes[10]	No	30-day supply of non-smokable marijuana	No	Yes[8]
Oregon (1998)	Yes	Yes	No	24 ounces, 6 mature plants, 18 seedlings	Yes	Yes
Rhode Island (2006)	Yes	Yes	Yes	2.5 ounces, 12 mature plants, 12 seedlings	Yes	Yes
Vermont (2004)	Yes	Yes	No	2 ounces, 2 mature plants, 7 immature plants	Yes	Yes
Washington (1998)	Yes	No	No	24 ounces, 15 plants	Yes	No

Reciprocity

As the table above indicates, most states do not accept the registry identification cards of other states. Of the twenty-three states with medical marijuana programs, only five states (Arizona, Maine, Michigan, New Hampshire, and Rhode Island) accept the registry identification cards of other states. While this means that visiting patients with valid out-of-state registry identification cards would be entitled to protection under the laws of these five states, it should be noted that three of these states (Arizona, Maine, and New Hampshire) explicitly prohibit visiting patients from obtaining medical marijuana from in-state dispensaries. Although Rhode Island law has no such prohibition, it does define the term "qualifying patient" as a resident of the state. Therefore, as a practical matter, it does not appear that dispensaries in Rhode Island would be permitted to dispense medical marijuana to visiting patients. Since Michigan has no distribution system, it appears that none of the five states that accept out-of-state registry identification cards provide a method for visiting patients to obtain medical marijuana.

Limited Access Marijuana Product Laws

In addition to the twenty-three states that have enacted medical marijuana programs, eleven states (Alabama,[15] Florida,[16] Iowa,[17] Kentucky,[18] Mississippi,[19] Missouri,[20] North Carolina,[21] South Carolina,[22] Tennessee,[23] Utah,[24] and Wisconsin[25]) have recently enacted statutes that, while not as comprehensive, provide for very limited access to marijuana for medical use. Unlike comprehensive medical marijuana programs, which generally provide for the use of a variety of marijuana strains, the statutes of these eleven states make provisions only for certain strains of marijuana and for limited medical or research purposes.

These statutes, often referred to as "limited access marijuana product laws," generally make provisions only for marijuana or marijuana-derived products that have low concentrations of tetrahydrocannabinol (THC), the main psychoactive constituent in marijuana. Some states additionally require that marijuana products have high concentrations of cannabidiol, a chemical compound of marijuana that is believed to be effective in the treatment of seizures and may counteract the psychoactive effects of THC. Most limited access states also specify that these types of marijuana products may only be used for treatment or research of specific health disorders, such as epileptic conditions or seizures.

Distribution models within these limited access states vary widely. Five states (Alabama,[26] Kentucky,[27] Mississippi,[28] Tennessee,[29] and Utah[30]) limit distribution of medical marijuana products to educational institutions. Florida limits distribution to five dispensing organizations, each located in a different state region.[31] Missouri authorizes the establishment of two cultivation and production facilities in the state, which will dispense products at cannabidiol oil care centers.[32] North Carolina does not specify a distribution model, other than to require that marijuana products be acquired from another jurisdiction.[33] South Carolina's law is silent regarding the manufacture and distribution of marijuana products, but does stipulate that clinical trials and products to be dispensed as part of any clinical trials are subject to approval by the United States Food and Drug Administration.[34] Iowa does not define the distribution method

[15] Act 2014-277, Acts of Alabama.
[16] Chapter 2014-157, Laws of Florida.
[17] Senate File 2360, Iowa Acts 2014.
[18] 2014 Kentucky Acts Chapter 112.
[19] Chapter 501, General Laws of Mississippi of 2014.
[20] House Bill 2238, Laws of Missouri, 2014.
[21] Session Law 2014-53, Session Laws of North Carolina.
[22] Act 221, Acts and Joint Resolutions of South Carolina, 2014.
[23] Chapter 936, Public Acts of Tennessee 2014.
[24] Chapter 25, Laws of Utah 2014.
[25] Act 267, 2014 Wisconsin Session Laws.
[26] Section 2 of Act 2014-277, Acts of Alabama.
[27] Section 1 of 2014 Kentucky Acts Chapter 112.
[28] Section 3 of Chapter 501, General Laws of Mississippi of 2014.
[29] Section 1 of Chapter 936, Public Acts of Tennessee 2014.
[30] Sections 2 and 3 of Chapter 25, Laws of Utah 2014.
[31] Section 2 of Chapter 2014-157, Laws of Florida.
[32] Section A of House Bill 2238, Laws of Missouri, 2014.
[33] Section 2 of Session Law 2014-53, Session Laws of North Carolina.
[34] Section 1 of Act 221, Acts and Joint Resolutions of South Carolina, 2014.

and Wisconsin provides no mechanism for production or manufacture of marijuana products. None of the limited access states recognize patients who are registered with other limited access states.

Chapter 4

DISTRIBUTION SYSTEMS

Eighteen states currently have medical marijuana programs that provide for the establishment of distribution systems. Most of these states require that distribution be regulated primarily at the state level. However, Colorado gives independent, dual jurisdiction to both the state and its counties. California is the only state where distribution of medical marijuana is regulated exclusively at the county and city level.

State Regulation of Distribution

Regulatory Structure

The distribution systems generally entail statewide regulation through registration, licensure, or permitting of third party entities to distribute medical marijuana.[1] In the seventeen states that have statewide regulation, twelve states (Arizona, Delaware, Illinois, Maine, Massachusetts, Minnesota, Nevada, New Hampshire, New York, Oregon, Rhode Island, and Vermont) have regulatory statutes that are registration statutes. Among the remaining five states, the regulatory statutes are licensing statutes (Colorado, Connecticut, Maryland, and New Mexico) or a permitting statute (New Jersey). These regulatory statutes were enacted as permanent laws in all but two of the states.[2]

With respect to these regulated third party entities, many states differentiate between "cultivation centers" and "dispensaries." Generally, cultivation centers grow medical marijuana, while dispensaries dispense medical marijuana to qualifying patients or their caregivers. However, the majority of the states (Arizona, Colorado, Delaware, Maine, Maryland,[3] Massachusetts, Minnesota, New Hampshire, New Jersey, New Mexico, New York, Rhode Island, and Vermont) allow the same entity to conduct both cultivation and dispensing operations. It should be noted that, even if an entity is allowed to dispense medical marijuana to a qualifying patient, states specifically do not permit the consumption of marijuana on the premises of such an entity.

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[1] Licensure and permitting statutes are generally considered to provide a more extensive level of oversight than a registration statute. For example, an application for registration may require basic information about a proposed business (e.g., name of the parties, address of the business, description of the business, etc.) in order for the state to determine whether its registration requirements have been met. On the other hand, an application for licensure may require more extensive information (e.g., detailed business plan, audited financial statements, tax records, background checks of the parties, etc.) in order to determine whether the parties involved have the financial resources and technical ability to operate the proposed business. However, this is merely a generalization and results may vary depending on the requirements of a particular state.

[2] Illinois enacted its regulatory statutes as a pilot program with a four-year sunset date, while New York enacted its statutes with a seven-year sunset date.

[3] *See* note 16, *infra*.

As indicated in table 4-1 below, the statutory terms used by states to refer to a third party that *cultivates* medical marijuana include "producer" (Connecticut), "cultivation center" (Illinois), and "cultivation facility" (Nevada). Likewise, the statutory terms used by states to refer to a third party that *dispenses* medical marijuana to a patient include "dispensary" (Connecticut), "dispensing organization" (Illinois), and "medical marijuana dispensary" (Nevada). In states where the third party entity engages in both cultivation and dispensing, and is regulated as an entity that engages in both types of activities, the statutory terms used to describe the third party entity include "compassion center" (Delaware, Rhode Island), "medical marijuana treatment center" (Massachusetts), "alternative treatment center" (New Hampshire), as well as "dispensary" (Arizona, Maine, and Vermont). For the purposes of general discussion, this report will use the terms "cultivation centers" and "dispensaries" to refer to third party entities that cultivate or dispense medical marijuana, respectively.

In eleven of the seventeen states (Arizona, Delaware, Maine, Massachusetts, Minnesota, New Hampshire, New Jersey, New Mexico, New York, Rhode Island, and Vermont), both the cultivation of medical marijuana and the dispensing of it to patients are covered under a single license, registration, or permit. Among the remaining states, the cultivation of medical marijuana and the dispensing of it to patients are covered under separate licenses (Colorado, Connecticut, and Maryland) or separate registrations (Illinois, Nevada, and Oregon). Colorado is somewhat unique in that a single entity generally holds the two separate licenses -- an "optional premises cultivation operation" license for cultivation and a "medical marijuana center" license for dispensing.

State regulation is generally placed under the jurisdiction of the state's health agency, although other alternatives include the state revenue agency (Colorado), the state consumer protection agency (Connecticut), and the state public safety agency (Vermont). Where separate state licenses are required for cultivation and for dispensing, regulation of both activities tends to be placed under the jurisdiction of the same state agency (Colorado, Connecticut, Maryland, Nevada, and Oregon), although one state, Illinois, divides state level jurisdiction between two different state agencies, specifically, its agriculture agency and its financial and professional regulation agency.

The table below lists the seventeen states and outlines their basic regulatory structure. Specifically, it indicates: whether the regulation of cultivation centers and dispensaries is handled jointly or separately; whether the level of regulation is licensure, registration, or permit; and the designation of the regulating authority.

Table 4-1. Regulatory Structure

State	Regulation	Cultivation Centers	Dispensaries
Arizona	Registration by the Department of Health Services	Nonprofit Medical Marijuana Dispensaries[4]	
Colorado[5]	State Licensure by the Executive Director of the Department of Revenue	Optional Premises Cultivation Operations[6]	Medical Marijuana Centers[7]
	County Licensure by the local licensing authority[8]	Optional Premises Cultivation Operations	Medical Marijuana Centers
Connecticut	Licensure by the Commissioner of Consumer Protection	Producers[9]	Dispensaries[10]

[4] Section 36-2801(11), Arizona Revised Statutes, defines "nonprofit medical marijuana dispensary" as "a not-for-profit entity that acquires, possesses, cultivates, manufactures, delivers, transfers, transports, supplies, sells or dispenses marijuana or related supplies and educational materials to cardholders."

[5] The state and county agencies do not issue joint licenses. They issue licenses independently of each other. Pursuant to Colorado Revised Statutes section 12-43.3-310(2), an applicant for a license "may not operate until it has been licensed by the local licensing authority and the state licensing authority pursuant to this article. If the state licensing authority issues the applicant a state license and the local licensing authority subsequently denies the applicant a license, the state licensing authority shall consider the local licensing authority denial as a basis for the revocation of the state-issued license."

[6] Colorado Revised Statutes section 12-43.3-403(1) specifies that an "optional premises cultivation license may be issued only to a person licensed pursuant to section 12-43.3-402(1) . . . who grows and cultivates medical marijuana at an additional Colorado licensed premises contiguous or not contiguous with the licensed premises of the person's medical marijuana center license[.]"

[7] Colorado Revised Statutes section 12-43.3-402(1), which specifies that a "medical marijuana center license shall be issued only to a person selling medical marijuana pursuant to the terms and conditions of this article." Section 12-43.3-402(3) also specifies that "[e]very person selling medical marijuana as provided for in this article shall sell only medical marijuana grown in its medical marijuana optional premises licensed pursuant to this article."

[8] Colorado Revised Statutes section 12-43.3-104(5) defines "local licensing authority" as "an authority designated by municipal or county charter, ordinance, or resolution, or the governing body of a municipality, city and county, or the board of county commissioners of a county if no such authority is designated."

[9] Pursuant to sections 21a-408(4) and 21a-408i, Connecticut General Statutes, a "producer" is licensed by the Commissioner of Consumer Protection, "organized for the purpose of cultivating marijuana for palliative use in [Connecticut,]" and is "qualified to cultivate marijuana and sell, deliver, transport or distribute marijuana solely within [Connecticut.]"

[10] Pursuant to sections 21a-408(3) and 21a-408h, Connecticut General Statutes, a "dispensary" is a pharmacist licensed by the Commissioner of Consumer Protection to "acquire, possess, distribute and dispense marijuana[.]"

State	Regulation	Cultivation Centers	Dispensaries
Delaware	Registration by the Department of Health and Social Services	Registered Compassion Centers[11]	
Illinois[12]	Registration by the Department of Agriculture	Cultivation Centers[13]	
	Registration by the Department of Financial and Professional Regulation		Dispensing Organizations[14]

[11] Delaware Code, title 16, section 4902A(12) defines "registered compassion center" as " a not-for-profit entity registered pursuant to § 4914A of this title that acquires, possesses, cultivates, manufactures, delivers, transfers, transports, sells, supplies, or dispenses marijuana, paraphernalia, or related supplies and educational materials to registered qualifying patients who have designated the dispenser to cultivate marijuana for their medical use and the registered designated caregivers of these patients."

[12] The Illinois statutes took effect on January 1, 2014, and are scheduled for repeal on January 1, 2018, pursuant to 410 Illinois Compiled Statutes 130/220 and 999 (2013).

[13] 410 Illinois Compiled Statutes 130/10(e) (2013) defines "cultivation center" as "a facility operated by an organization or business that is registered by the Department of Agriculture to perform necessary activities to provide only registered medical cannabis dispensing organizations with usable medical cannabis."

[14] 410 Illinois Compiled Statutes 130/10(o) (2013) defines "dispensing organization" as "a facility operated by an organization or business that is registered by the Department of Financial and Professional Regulation to acquire medical cannabis from a registered cultivation center for the purpose of dispensing cannabis, paraphernalia, or related supplies and educational materials to registered qualifying patients."

State	Regulation	Cultivation Centers	Dispensaries
Maine	Registration by the Department of Health and Human Services	Dispensaries[15]	
Maryland	Licensure by the Natalie M. LaPrade Medical Marijuana Commission	Medical Marijuana Growers[16]	Dispensaries[17]
Massachusetts	Registration by the Department of Public Health	Medical Marijuana Treatment Centers[18]	
Minnesota	Registration by the Commissioner of Health	Medical Cannabis Manufacturers[19]	

[15] Maine Revised Statutes, title 22, section 2422(6), defines "dispensary" as "a not-for-profit entity registered under section 2428 that acquires, possesses, cultivates, manufactures, delivers, transfers, transports, sells, supplies or dispenses marijuana or related supplies and educational materials to qualifying patients and the primary caregivers of those patients."

[16] Although their primary purpose is to cultivate medical marijuana, section 13-3309 of the Health-General Article, Code of Maryland (as amended by chapters 240 and 256, 2014 Laws of Maryland), authorizes medical marijuana growers to provide medical marijuana directly to qualifying patients and caregivers, as well.

[17] Section 13-3301 of the Health-General Article, Code of Maryland (as amended by chapters 240 and 256, 2014 Laws of Maryland), defines "dispensary" as "an entity licensed under this subtitle that acquires, possesses, processes, transfers, transports, sells, distributes, dispenses, or administers marijuana, products containing marijuana, related supplies, related products including food, tinctures, aerosols, oils, or ointments, or educational materials for use by a qualifying patient or caregiver."

[18] Chapter 369, section 2(H), Massachusetts Acts 2012, defines "medical marijuana treatment center" as "a not-for-profit entity, as defined by Massachusetts law only, registered under this law, that acquires, cultivates, possesses, processes (including development of related products such as food, tinctures, aerosols, oils, or ointments), transfers, transports, sells, distributes, dispenses, or administers marijuana, products containing marijuana, related supplies, or educational materials to qualifying patients or their personal caregivers."

[19] Chapter 311, section 2, Laws of Minnesota 2014, defines "medical cannabis manufacturer" as "an entity registered by the commissioner to cultivate, acquire, manufacture, possess, prepare, transfer, transport, supply, or dispense medical cannabis, delivery devices, or related supplies and educational materials." *But see* note 54, *infra,* and accompanying text.

State	Regulation	Cultivation Centers	Dispensaries
Nevada	Registration by the Division of Public and Behavioral Health of the Department of Health and Human Services	Cultivation Facilities[20]	Medical Marijuana Dispensaries[21]
New Hampshire	Registration by the Department of Health and Human Services	Alternative Treatment Centers[22]	
New Jersey	Permit from the Department of Health	Alternative Treatment Centers[23]	
New Mexico	Licensure by the Department of Health	Licensed Producers[24]	

[20] Section 453A.056, Nevada Revised Statutes, defines "cultivation facility" as a business registered with the Department of Health and Human Services that "[a]cquires, possesses, cultivates, delivers, transfers, transports, supplies or sells marijuana and related supplies to:

(a) Medical marijuana dispensaries;
(b) Facilities for the production of edible marijuana products or marijuana-infused products; or
(c) Other cultivation facilities."

[21] Section 453A.115, Nevada Revised Statutes, defines "medical marijuana dispensary" as a business registered with the Department of Health and Human Services that "[a]cquires, possesses, delivers, transfers, transports, supplies, sells or dispenses marijuana or related supplies and educational materials to the holder of a valid registry identification card."

[22] Section 126-X:1(I), New Hampshire Revised Statutes, defines "alternative treatment center" as a not-for-profit entity registered with the Department of Health and Human Services that "acquires, possesses, cultivates, manufactures, delivers, transfers, transports, sells, supplies, and dispenses cannabis, and related supplies and educational materials, to qualifying patients and alternative treatment centers."

[23] Section 24:6I-3, New Jersey Revised Statutes, defines "alternative treatment center" as "an organization approved by the department to perform activities necessary to provide registered qualifying patients with usable marijuana and related paraphernalia[.]" Section 24:6I-7, New Jersey Revised Statutes, authorizes alternative treatment centers to "acquire a reasonable initial and ongoing inventory, as determined by the department, of marijuana seeds or seedlings and paraphernalia, possess, cultivate, plant, grow, harvest, process, display, manufacture, deliver, transfer, transport, distribute, supply, sell, or dispense marijuana, or related supplies to qualifying patients or their primary caregivers who are registered with the department[.]"

[24] Section 26-2B-3, New Mexico Statutes Annotated, defines "licensed producer" as "any person or association of persons within New Mexico that the [Department of Health] determines to be qualified to produce, possess, distribute and dispense cannabis pursuant to the Lynn and Erin Compassionate Use Act and that is licensed by the department[.]"

State	Regulation	Cultivation Centers	Dispensaries
New York	Registration by the Commissioner of Health	Registered Organizations[25]	
Oregon	Registration by the Oregon Health Authority	Marijuana Grow Sites[26]	Medical Marijuana Facilities[27]
Rhode Island	Registration by the Department of Health	Compassion Centers[28]	
Vermont	Registration by the Department of Public Safety	Dispensaries[29]	

Operational Requirements

The seventeen states impose a variety of operational requirements on cultivation centers and dispensaries. Simply doing business as a cultivation center or dispensary will subject an entity to various application and renewal fees, and sales of medical marijuana will likely be subject to various state and local taxes. The following table outlines the taxes and fees that apply to cultivation centers and dispensaries.

[25] New York Public Health Law, section 3364(1), defines "registered organization" as "a for-profit business entity or not-for-profit corporation organized for the purpose of acquiring, possessing, manufacturing, selling, delivering, transporting, distributing or dispensing marihuana for certified medical use."

[26] Section 475.302(7), Oregon Revised Statutes, defines "marijuana grow site" as a location registered with the Oregon Health Authority "where marijuana is produced for use by a registry identification cardholder."

[27] Pursuant to section 475.314(1), Oregon Revised Statutes, a medical marijuana facility is authorized to transfer "usable marijuana and immature marijuana plants from:

(a) A registry identification cardholder, the designated primary caregiver of a registry identification cardholder, or a person responsible for a marijuana grow site to the medical marijuana facility; or

(b) A medical marijuana facility to a registry identification cardholder or the designated primary caregiver of a registry identification cardholder."

[28] Section 21-28.6-3(2), Rhode Island General Laws, defines "compassion center" as "a not-for-profit corporation . . . that acquires, possesses, cultivates, manufactures, delivers, transfers, transports, supplies or dispenses marijuana, and/or related supplies and educational materials, to registered qualifying patients and/or their registered primary caregivers who have designated [the compassion center] as one of their primary caregivers."

[29] Vermont Statutes, title 18, section 4472(5), defines "dispensary" as "a nonprofit entity . . . which acquires, possesses, cultivates, manufactures, transfers, transports, supplies, sells, or dispenses marijuana, marijuana-infused products, and marijuana-related supplies and educational materials for or to a registered patient who has designated it as his or her center and to his or her registered caregiver for the registered patient's use for symptom relief."

Table 4-2. Fees and Taxes Applicable to Cultivation Centers and Dispensaries

State	Fees	Taxes
Arizona[30]	$5,000 application fee, $1,000 renewal fee	5.6% state sales tax, Variable local taxes
Colorado[31]	Medical Marijuana Centers: $6,000 to $14,000 application fee $3,000 to $11,000 license fee $3,300 to $11,300 renewal fee Optional Premises Cultivation Operations: $1,000 application fee $2,200 license fee $2,500 renewal fee	2.9% state sales tax, Variable local taxes
Connecticut[32]	Dispensaries: $1,000 application fee, $1,000 per year license and renewal fees Producers: $25,000 application fee, $75,000 annual license and renewal fee	6.35% state sales tax
Delaware[33]	$5,000 application fee, $40,000 annual certification and renewal fees	Gross receipts tax on revenue in excess of $1.2 million
Illinois[34]	Fees will be determined by administrative rule	7% excise tax, 1% state sales tax
Maine[35]	$15,000 application fee, $15,000 renewal fee	5.5% state sales tax, or 8% tax on edible products
Maryland[36]	Fees to be determined by administrative rule	6% state sales tax
Massachusetts[37]	$31,500 in fees for a 2-step application process, $50,000 annual registration fee	Likely not subject to state sales tax
Minnesota[38]	$20,000 application fee, Annual fee to be established by Commissioner of Health	Sale of medical cannabis is not taxed

[30] *See* section R9-17-102, Arizona Administrative Code.
[31] *See* sections M 206, 207, and 208 of 1 Colorado Code of Regulations 212-1.
[32] *See* section 21a-408-28, Regulations of Connecticut State Agencies.
[33] *See* sections 7.6.1, 7.9.1, and 7.10.2.1 of 16 Delaware Administrative Code 4470.
[34] *See* 410 Illinois Compiled Statutes 130, sections 115, 125, 200, and 915, Laws of Illinois 2013.
[35] *See* sections 7.4.1, and 7.4.2 of 10-144 Code of Maine Rules chapter 122.
[36] *See* section 13-3304(c) of the Health-General Article, Code of Maryland (as amended by chapters 240 and 256, 2014 Laws of Maryland).
[37] *See* 801 Code of Massachusetts Regulations 4.02(105).
[38] *See* chapter 311, section 15, Laws of Minnesota 2014.

State	Fees	Taxes
Nevada[39]	Medical Marijuana Dispensaries: $5,000 application fee $30,000 registration fee $5,000 renewal fee Cultivation Facilities: $5,000 application fee $3,000 registration fee $1,000 renewal fee	2% excise tax on wholesale sales, 2% excise tax on retail sales, 6.85% state sales tax, Variable local taxes
New Hampshire[40]	Fees will be established by Department of Health and Human Services	No sales tax
New Jersey[41]	$20,000 application fee ($18,000 refunded to unsuccessful applicants), $20,000 renewal fee	7% state sales tax
New Mexico[42]	$1,000 application fee, $5,000 to $30,000 renewal fee	5.125 state gross receipts tax, Variable local taxes
New York[43]	Fees to be determined by the Commissioner of Health	7% excise tax
Oregon[44]	$4,000 application fee, $4,000 renewal fee	No sales tax
Rhode Island[45]	$250 application fee, $5,000 registration fee, $5,000 renewal fee	4% compassion center surcharge, 7% state sales tax
Vermont[46]	$2,500 application fee, $20,000 registration fee, $30,000 renewal fee	Likely not subject to state sales tax

Further, the majority of the seventeen states also require dispensaries to comply with various requirements pertaining to the training of employees who dispense medical marijuana to qualifying patients, as well as to provision of educational materials to qualifying patients. The following table summarizes these requirements.

[39] *See* sections 453A.344 and 372A.075, Nevada Revised Statutes.
[40] *See* section 126-X:7, New Hampshire Revised Statutes.
[41] *See* sections 8:64-6.5 and 8:64-7.10, New Jersey Administrative Code.
[42] *See* section 7.34.4.8(Q), New Mexico Administrative Code.
[43] *See* New York State Public Health Law, section 3364(3)-(5), and New York State Tax Law, section 490(2).
[44] *See* section 333-008-1030, Oregon Administrative Rules.
[45] *See* sections 21-28.6-12(c) and (d) and 44-67-3, Rhode Island General Laws.
[46] *See* 28-000-003 Code of Vermont Rules section 7.4 and 7.5.

Table 4-3. Staff Training and Patient Education Requirements

State	Staff Training	Patient Education
Arizona[47]	• Guidelines for providing information to qualifying patients related to risks, benefits, and side effects associated with marijuana; • Guidelines for providing support to qualifying patients related to the patient's self-assessment of the patient's symptoms; • Recognizing signs and symptoms of substance abuse; and • Guidelines for refusing to provide medical marijuana to an individual who appears to be impaired or abusing medical marijuana.	Patient education and support, including: • Availability of different strains of marijuana and the purported effects of each strain; • Information about the purported effectiveness of various methods, forms, and routes for medical marijuana administration; • Methods of tracking the effects of different strains and forms of marijuana; and • Prohibition on the smoking of marijuana in public places.
Colorado[48]	Occupational licenses required	--
Connecticut[49]	• On-the-job and other related education; • Professional conduct, ethics, and state and federal statutes and regulations regarding patient confidentiality; and • Developments in the field of the medical use of marijuana.	Informational material related to: • Limitations on the right to possess and use marijuana; • Safe techniques for proper use of marijuana and paraphernalia; • Alternative methods and forms of consumption or inhalation; • Signs and symptoms of substance abuse; and • Opportunities to participate in substance abuse programs.
Delaware[50]	• Professional conduct, ethics, and state and federal laws regarding patient confidentiality; • Informational developments in the field of medical use of marijuana; • The proper use of security measures and controls that have been adopted; and • Specific procedural instructions for responding to an emergency, including robbery or violent accident.	Explanation of: • Limitations on the right to use medical marijuana under state law; • Ingestion options of usable marijuana; • Safe smoking techniques; and • Potential side effects.

[47] *See* sections R9-17-310(A)(2)(e) and R9-17-313(C), Arizona Administrative Code.
[48] *See* section M 233 of 1 Colorado Code of Regulations 212-1.
[49] *See* sections 21a-408-34(o) and 21a-408-44(a), Regulations of Connecticut State Agencies.
[50] *See* sections 7.3.9 and 7.4 of 16 Delaware Administrative Code 4470.

State	Staff Training	Patient Education
Illinois[51]	--	Department of Public Health must develop and distribute educational information on health risks of abuse of cannabis and prescription drugs.
Maine[52]	Dispensaries must have written policies regarding job description and employment contracts, including training.	Educational materials regarding: • Strains of marijuana and different effects; • Proper dosage for different modes of administration; • Tolerance, dependence, and withdrawal; • Substance abuse signs and symptoms; and • Whether the dispensary's marijuana and associated products meet organic certification standards.
Maryland	--	--
Massachusetts[53]	8 hours of ongoing annual training on topics specified by the Department of Public Health, including confidentiality.	Educational materials, including: • Health and safety warnings; • Information to assist in the selection of marijuana; • Materials to enable patients to track the strains used and their associated effects; • Information describing proper dosage and titration for different routes of administration; • A discussion of tolerance, dependence, and withdrawal; • Substance abuse signs and symptoms; • Referral information for substance abuse treatment programs; • A statement that qualifying patients may not distribute marijuana to any other individual, and that they must return unused, excess, or contaminated product to the dispensary for disposal; and • Any other information required by the Department of Public Health.

[51] *See* 410 Illinois Compiled Statutes 130, section 15(a)(2), Laws of Illinois 2013.
[52] *See* sections 6.9.3 and 6.9.5 of 10-144 Code of Maine Rules chapter 122.
[53] *See* 105 Code of Massachusetts Regulations 725.105(H) and (K).

State	Staff Training	Patient Education
Minnesota[54]	Only licensed pharmacists may dispense medical marijuana to patients.	--
Nevada[55]	• Security measures and controls that have been adopted by the dispensary; • Procedures and instructions for responding to an emergency; • State and federal statutes and regulations regarding confidentiality; • Instruction on different strains of cannabis and different methods of using cannabis and cannabis products; and • Learning to recognize signs of medicine abuse or instability in patient use of medical marijuana.	Patient education and support, including: • Availability of different strains of marijuana and the purported effects of the different strains; • Information about the purported effectiveness of various methods, forms and routes of medical marijuana administration; and • Prohibition on the smoking of medical marijuana in public places, places open to the public, and places exposed to public view.
New Hampshire[56]	Alternative treatment centers must develop, implement, and maintain policies on employee training, including instruction on confidentiality laws and security measures and controls adopted by the center.	Educational materials including information on: • Strains of cannabis, routes of administration, and their different effects; • Proper dosage for different modes of administration; • Tolerance, dependence, and withdrawal; • Substance abuse signs and symptoms; • Whether the alternative treatment center's cannabis and associated products meet organic certification standards; and • Possible side effects from the use of cannabis for therapeutic purposes.

[54] *See* chapter 311, section 9(3), Laws of Minnesota 2014.
[55] *See* sections 41(d)(3) and 54(e) of Adopted Regulation of the Division of Public and Behavioral Health of the Nevada Department of Health and Human Services No. R004-14.
[56] *See* section 126-X:8(XVI)(c) and (XVII)(a), New Hampshire Revised Statutes.

State	Staff Training	Patient Education
New Jersey[57]	• Professional conduct, ethics and state and federal laws regarding patient confidentiality; • Informational developments in the field of medical use of marijuana; • Proper use of security measures and controls that have been adopted by the alternative treatment center; and • Specific procedural instructions for responding to an emergency, including a robbery or workplace violence.	Provision of information on: • Limitations of the right to possess and use marijuana under state law; • Potential side effects of marijuana use; • Differing strengths of products dispensed; • Safe techniques for use of medical marijuana and paraphernalia; • Alternative methods and forms of consumption or inhalation; • Signs and symptoms of substance abuse; • Opportunities to participate in substance abuse programs; and • Tolerance, dependence, and withdrawal.
New Mexico[58]	• State and federal confidentiality laws; • Professional conduct and ethics; • Informational developments in the field of medical use of cannabis; and • Employee safety and security training.	Educational materials on: • The limitation of the right to possess and use cannabis; • The quality of the product; • Ingestion options of usable marijuana; • Safe smoking techniques; and • Potential side effects.
New York[59]	--	Provision of a safety insert with information on: • Methods for administering medical marijuana in individual doses; • Any potential dangers stemming from the use of medical marijuana; • How to recognize what may be problematic usage of medical marijuana and obtain appropriate services or treatment for problematic usage; and • Other information, as determined by the Commissioner of Health.

[57] *See* sections 8:64-9.5(b) and 8:64-11.1, New Jersey Administrative Code.
[58] *See* sections 7.34.4.8(I) and 7.34.4.10(D), New Mexico Administrative Code.
[59] *See* New York State Public Health Law, section 3364(6).

State	Staff Training	Patient Education
Oregon[60]	Employees must be trained in the registered facility's policies and procedures regarding: • Security; • Testing; • Transfers of usable marijuana and plants to and from the facility; • Operation of a registered facility; • Required record keeping; • Labeling; and • Violations and enforcement.	--
Rhode Island[61]	• Professional conduct, ethics, and patient confidentiality; • Informational developments in the field of medical use of marijuana; • Proper use of security measures and controls that have been adopted; and • Specific procedural instructions on how to respond to an emergency, including robbery or violent accident.	Provision of information on: • The limitations on the right to use medical marijuana under state law; • Ingestion options of useable marijuana; • Safe smoking techniques; and • Potential side effects.
Vermont[62]	• Confidentiality laws; • Proper use of security measures and controls that have been adopted; and • Specific procedural instructions on how to respond to an emergency, including robbery or violent incident.	Educational materials regarding: • Strains of marijuana and different effects; • Proper dosage for different modes of administration; • Tolerance, dependence, and withdrawal; and • Substance abuse signs and symptoms.

The majority of the seventeen states also require dispensaries to affix labels to the products they dispense. These labels are intended to convey important information about the products to the qualifying patients. The following table summarizes the labeling requirements of the seventeen states.

[60] *See* section 333-008-1200(4), Oregon Administrative Rules.
[61] *See* sections 5.1.8(i) and 5.1.9 of the Rules and Regulations Related to the Medical Marijuana Program [R21-28.6-MMP], Rhode Island Department of Health.
[62] *See* Vermont Statutes, title 18, section 4474e(j) and 28-000-003 Code of Vermont Rules section 6.25.4.