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REVIEW ARTICLE

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Review of cannabis reimbursement by workers' compensation insurance in the U.S. and Canada

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Abstract

Changing public attitudes about cannabis consumption have currently led 36 U.S. states and the District of Columbia to approve laws that make cannabis available to consumers with qualifying medical conditions. This article reviews the 36 states and the District of Columbia with medical cannabis access laws to determine if the state or the District also allows reimbursement of the costs of cannabis for a work-related health condition under that state's or District's workers' compensation insurance (WCI) laws and administrative regulations. The legal basis for a state allowing or not allowing WCI reimbursement is described. The review found that only six of the 36 states expressly allow cannabis WCI reimbursement, six expressly prohibit it, 14 states do not require reimbursement, and 10 states, and the District of Columbia, are silent on the issue. The article describes the role of the insurer, treating physician, and worker in obtaining WCI reimbursement in the six states that expressly allow cannabis WCI reimbursement. Comparisons are made to how selected Canadian provinces and territories administer cannabis reimbursement under Canada's new national cannabis legalization law. The article discusses the future role of cannabis legalization in the United States and the evolving role of cannabis from an international perspective.

KEYWORDS

CBD, cannabinoids, descheduling, reimbursement, THC

1 | INTRODUCTION

Cannabis sativa is a plant that has been used by humans for several thousand years as an industrial product, as a medicinal, and for recreational enjoyment.[1] In the United States, cannabis has a complex history. During colonial times, cannabis was grown as an agricultural product to make yarn, rope, and canvas. By the 1930s, cultivation, possession, and use of cannabis became illegal as a part of the federal government's war on drug abuse.[2] In 1970, cannabis, together with heroin, lysergic acid diethylamide, 3,4-methylenedioxymethamphetamine ("Ecstasy"), peyote, and methaqualone, was categorized by the federal Controlled Substance Act (CSA) as a Schedule I substance.[3] A Schedule I substance is a drug or substance that "has a high potential for abuse, has no currently accepted medical use in treatment in the United States and for which there is a lack of accepted safety for use of the drug or substance under medical supervision."[4]

Cannabis sativa contains approximately 565 separate chemicals, 120 of which are called cannabinoids.[5] Resin from the plant contains a mixture of cannabinoids, of which two are the most prominent. One is the major mood-altering constituent, *delta-9-tetrahydrocannabinol* (Δ^9-THC), and the other is the non-psychoactive, potent anti-inflammatory constituent, *cannabidiol* (CBD).[6,7] All cannabis products remain illegal under federal law except for one. In 2018, the Agricultural Improvement Act legalized the cultivation and sale of a

specific cannabis product called "hemp."[8] Hemp is now defined by federal law as a cannabis product which contains less than 0.3% on a dry weight basis of Δ^9-THC.[9] Most US states allow the use of CBD if sourced from hemp as it is defined under the 2018 Agricultural Improvement Act.

Beginning in the 1990s, changing public attitudes about cannabis consumption in the United States have led 36 states and the District of Columbia (DC) to approve laws that make cannabis available to consumers with qualifying medical conditions.[10] The list of qualifying health conditions for medical cannabis access varies from state to state,[11] but generally includes a wide variety of conditions like cancer, multiple sclerosis, epilepsy, glaucoma, and other conditions such as low back injuries that are characterized by chronic pain.[11] Some states, like California, provide catch-all access for "any debilitating illness where the medical use of marijuana has been deemed appropriate and has been recommended by a physician."[11,12]

The origin of state medical cannabis access laws is through state legislative action or through voter ballot initiatives. Not all voter initiatives survive subsequent legal challenges. For example, a November 2020 voter initiative in Mississippi—Proposition 65—legalized medical cannabis access by majority voter support but was overturned by the Mississippi Supreme Court on May 14, 2021.[13]

Despite legalization of medical cannabis in 36 states for a broad scope of health conditions, insurance companies generally do not reimburse the costs of cannabis because it is not a drug approved by the U.S. Food and Drug Administration (FDA). However, the FDA has approved a pure solution of CBD, *Epidiolex*, for treatment of two rare forms of childhood epilepsy,[14] and two synthetic Δ^9-THC drugs, *Dronabinol* and *Nabilone*, for chemotherapy-related nausea and vomiting.[15,16] The cost of cannabis for treating a work-related health condition falls on the worker. Whether reimbursement by state-based (nonfederal) workers' compensation insurance (WCI) is allowed in any of the 36 medical cannabis access states varies from state to state and represents a confusing and ever-changing picture.[17]

The article reviews the 36 medical cannabis access states and DC to determine their position on cannabis WCI reimbursement and the basis for allowing or not allowing such reimbursement. Using examples from the six states that allow cannabis WCI reimbursement, the article describes the factors involved in obtaining coverage of the cost of cannabis by WCI. Comparison is made to how Canadian provinces and territories administer cannabis reimbursement under Canada's new federal legalization law. Finally, the potential for cannabis legalization in the United States is reviewed along with the evolving role of cannabis from the international perspective.

1.1 | Review of cannabis WCI reimbursement by U.S. state

A review of the 36 states that currently allow medical cannabis access reveals four groups based on whether the state also allows cannabis WCI reimbursement. Six states of the 36 medical cannabis access states expressly allow WCI reimbursement, and six states expressly prohibit reimbursement. Fourteen states provide that reimbursement by any "insurer," that is, health or property-casualty insurer like a workers' compensation insurer, is not required. The remaining 10 states and DC lack a discernable position on cannabis WCI reimbursement (see Table 1).

TABLE 1 Medical cannabis access states categorized by cannabis reimbursement status

Expressly allowed	Expressly prohibited	Not required	Silent
Connecticut	Maine	Arizona	Alaska
Minnesota	Massachusetts	Arkansas	Hawaii
New Hampshire	Florida	California	Maryland
New Jersey	North Dakota	Colorado	Mississippi
New Mexico	Ohio	Delaware	Missouri
New York	Washington	Illinois	Oklahoma
		Louisiana	Rhode Island
		Michigan	South Dakota
		Montana	Virginia
		Nevada	West Virginia
		Oregon	
		Pennsylvania	
		Utah	
		Virginia	

1.1.1 | Group 1—Reimbursement expressly allowed

Of the six states that allow cannabis WCI reimbursement, four do so based on a state court decision. These states are New Hampshire, New Jersey, New Mexico, and New York. One state, Connecticut, allows cannabis WCI reimbursement based on a state workers' compensation administrative panel decision. One state, Minnesota, allows cannabis WCI reimbursement based on a state general administrative rule.

Connecticut. In a 2016 decision by the Workers' Compensation Review Board of the Connecticut Workers' Compensation Commission, the Commission determined that medical cannabis was reimbursable if the use of cannabis constitutes "reasonable and necessary" medical treatment for a compensable injury.[18]

Minnesota. In July 2015, the Minnesota Department of Labor and Industry enacted an administrative rule that redefined "illegal substance" to *exclude* the use of medical cannabis that is permitted under Minnesota's medical cannabis access law.[19] Minnesota's current position may change. On May 3, 2021, the Minnesota Supreme Court heard legal challenges from two workers' compensation insurers[20,21] that argued that coverage of medical cannabis would put them at risk of aiding and abetting a federal crime.[22] Those cases are unresolved at the present time.

New Hampshire. On March 2, 2021, the New Hampshire Supreme Court ruled that the CSA does not preempt the New Hampshire Compensation Appeals Board from ordering a workers' compensation insurer to reimburse a claimant for medical cannabis expenses incurred as "reasonable medical… care…".[23]

New Jersey. On April 13, 2021, the New Jersey Supreme Court upheld decisions by a workers' compensation court and a New Jersey Appellate Division court that cannabis may be found, subject to competent medical testimony, to constitute "reasonable and necessary" treatment under the state's Workers' Compensation Act and that the state's Compassionate Use Marijuana Act can compel the injured worker's employer to reimburse the cannabis costs.[24]

New Mexico. In 2014 and 2015, three New Mexico Courts of Appeal cases were the earliest indicators in the United States of the impact that state medical cannabis access laws would have on the role of cannabis as a WCI medical benefit.[25–27] These three cases found that medical cannabis was "reasonable and necessary" to treat chronic pain from work-related injuries and that employers and insurers were required to reimburse injured workers for their cannabis treatment costs.

New York. On February 25, 2021, a New York State Supreme Court, Appellate Division, ruled in the *Matter of Quigley* that a workers' compensation insurer must reimburse an injured worker for cannabis to relieve pain from a workplace injury.[28] The court held that New York State (NYS) Compassionate Care Act does not conflict with and is not preempted by, the federal CSA because the insurer is merely required to *reimburse* a claimant for the costs associated with medical cannabis—reimbursement being an activity that is not expressly prohibited by the CSA.[28] The *Quigley* case was decided under a variance procedure in the NYS medical cannabis access procedures. Individuals whose medical condition is not on the NYS list of qualifying medical conditions can have their treating physician request a variance to obtain approval of cannabis access for their particular medical condition.[29]

1.1.2 | Group 2—Reimbursement expressly prohibited

Six states that allow medical cannabis access expressly prohibit cannabis WCI reimbursement. In two of the six states, Massachusetts and Maine, state courts have determined that cannabis is not reimbursable because federal law preempts state medical cannabis access. In two states, Florida and North Dakota, state legislation was enacted expressly to prohibit WCI reimbursement of medical cannabis. In two states, Ohio and Washington, an administrative rule governing workers' compensation adopted before the state's medical cannabis access law prohibits WCI reimbursement of medical cannabis because cannabis is not a drug approved by the FDA.

Maine. In a 2018 court case, *Gaetan H. Bourgoin v. Twin Rivers Paper Company, LLC, et al.*,[30] the Maine Supreme Judicial Court held, "Where an employer is subject to an order that would require it to subsidize an employee's acquisition of medical marijuana there is a positive conflict between federal law and state law. As a result, the federal CSA preempts the [Maine Medical Use of Marijuana Act] as applied from cannabis reimbursement."[30]

Massachusetts. On October 27, 2020, the Massachusetts Supreme Court held that employees who purchase cannabis to cope with a work-related injury cannot get reimbursed for the costs of cannabis through WCI.[31] The Court reasoned that "[i]t is one thing for a State statute to authorize those who want to use medical marijuana… and to assume the potential risk of Federal prosecution, it is quite another for it to require third parties to pay for such use and risk such prosecution."[31]

Florida. In 2020, the Florida Legislature amended Florida Statute § 381.986, pertaining to the medical use of marijuana, to state, "Marijuana, as defined in this section, is not reimbursable under chapter 440" (which pertains to Florida's Workers' Compensation Insurance Program).[32]

North Dakota. Under legislation enacted in March of 2012, North Dakota's state-administered workers' compensation fund is prohibited from reimbursing the costs of medical cannabis.[33]

Ohio. According to administrative rules governing Ohio's Bureau of Workers' Compensation (BWC) that existed before Ohio's adoption in 2016 of a medical cannabis access law, medical cannabis is *ineligible* for reimbursement as an outpatient medication.[34] Payment for outpatient medications is limited to those that are: (1) on the BWC's pharmaceutical formulary; (2) approved for human use by the FDA; and (3) dispensed by a registered pharmacist from an enrolled pharmacy provider.[35]

Washington. Like Ohio, Washington State only considers payment for drugs that are approved by the FDA.[36] As a result, cannabis is denied coverage in the state's outpatient formulary.[37]

1.1.3 | Group 3—Reimbursement not required

Fourteen states make clear that insurers—health insurers or property-casualty insurers like workers' compensation insurers—are not obligated to reimburse the costs of medical cannabis.

Arizona. In 2015, Arizona amended the Arizona Medical Marijuana Act by establishing that nothing in the Act would require a workers' compensation carrier or self-insured employer to reimburse the costs associated with the medical use of cannabis.[38]

Arkansas. The Medical Marijuana Amendment of 2016 "… does not require a government medical assistance program or private insurer to reimburse a person for costs associated with the medical use of marijuana, unless federal law requires reimbursement."[39]

California. The California Workers' Compensation Appeals Board found that "Nothing… shall require a governmental, private, or any other health insurance provider or health care service plan to be liable for any claim for reimbursement for the medical use of marijuana."[40]

Colorado. Colorado's medical cannabis law states that "No governmental, private, or any other health insurance provider shall be required to be liable for any claim for reimbursement for the medical use of marijuana."[41]

Delaware. Reimbursement for the cost of medical cannabis for a workers' compensation claim is not required and reimbursement depends on whether medical cannabis treatment is "reasonable and necessary" based on an "individualized inquiry."[42]

Illinois. Illinois law provides that, "Nothing in this Act [Compassionate Use of Medical Cannabis Program Act] may be construed to require a government medical assistance program, employer, property and casualty insurer, or private health insurer to reimburse a person for costs associated with the medical use of cannabis."[43]

Louisiana. In 2018, Louisiana amended its cannabis access law to state that, "Notwithstanding any other provision of law to the contrary, employers and their workers' compensation insurers shall not be obliged or ordered to pay for medical marijuana in claims arising under Title 23 of the Louisiana Revised Statutes of 1950, the Louisiana Workers' Compensation Law."[44]

Michigan. Workers' compensation insurers are not required to reimburse workers for costs related to medical cannabis treatment.[45]

Montana. The Montana medical cannabis access law does not require, but does not expressly prohibit, WCI reimbursement as cannabis cannot be legally prescribed by a physician under federal law.[46]

Nevada. Nevada law does not require an insurer, organization for managed care, or any person or entity who provides coverage for a medical or healthcare service to pay for, or reimburse, a person for costs of medical cannabis.[47]

Oregon. Oregon revised statute, Chapter 475B (Cannabis Regulation), provides that, "Nothing in ORS 475B.400 to 475B.525 requires: (1) A government medical assistance program or private health insurer to reimburse a person for costs associated with the medical use of marijuana; or (2) An employer to accommodate the medical use of marijuana in the workplace."[48]

Pennsylvania. The 2016 Pennsylvania Medical Marijuana Act states, "Nothing in this act shall be construed to require an insurer or a health plan, whether paid for by Commonwealth funds or private funds, to provide coverage for medical marijuana."[49] On June 2, 2021, a Pennsylvania workers' compensation judge ruled that a claimant's claims for cannabis reimbursement were reasonable and ordered that the claimant's former employer reimburse the claimant for the costs of cannabis and cover costs going forward.[50]

Utah. The 2018 Utah Medical Cannabis Act states, "Nothing in the law requires an employer, third party administrator or insurer to reimburse or pay for medical marijuana or devices for use."[51]

Vermont. The Vermont Department of Labor determined that an injured worker's use of medical cannabis for pain relief could be a reasonable and necessary medical treatment for a work injury. However, Vermont medical marijuana access law precludes compelling an employer or insurer to reimburse the costs of cannabis.[52]

1.1.4 | Group 4—Reimbursement position not discernable

Ten states and DC that allow medical cannabis access are currently without a readily discernable position on WCI reimbursement. Alaska, Hawaii, Maryland, Mississippi, Missouri, Oklahoma, Rhode Island, South Dakota, Virginia, and West Virginia are "silent" on the question of WCI cannabis reimbursement.

1.2 | Factors involved in cannabis WCI reimbursement

In the six states that expressly allow WCI reimbursement for cannabis, the process of obtaining reimbursement is not automatic. WCI reimbursement is a medical benefit that is based on a worker's approved participation in, and conformance with, the state's administrative rules regarding medical cannabis access. Several factors are involved in obtaining cannabis WCI reimbursement to treat a work-related health condition. Each of the factors involved in obtaining cannabis WCI reimbursement is described using examples from one or more of the six states that expressly allow such reimbursement.

Workers' compensation insurance claim. Under WCI, an employer is only responsible for a work-related injury or illness that qualifies the employee for wage replacement and medical care benefits. A valid or compensable claim is based on a determination that the health condition is work-related and medical benefits are needed to aid the worker's return to productive employment.[53]

Diagnosis of a qualifying medical condition. To qualify for WCI reimbursement, a worker must have a qualifying medical condition recognized by that state's medical cannabis access law. The health conditions that qualify for medical cannabis in states that expressly allow cannabis WCI reimbursement are similar and include, but are not limited to, the following: cancer, multiple sclerosis, traumatic brain or spinal injury, epilepsy, glaucoma, and any medical condition causing chronic, severe, or intractable pain.[54–57]

Evidence supporting state's list of qualifying medical conditions. Recent systematic reviews of cannabis for medical use have found preliminary evidence to support the use of cannabinoids for the treatment of three conditions: (1) chronic neuropathic and end-of-life pain, (2) spasticity due to multiple sclerosis or spinal cord injury, and (3) as an antiemetic for chemotherapy-induced nausea and vomiting.[58,59] However, even when cannabis is considered as an alternative to opioids for chronic pain, there is uncertainty about whether cannabis should be considered an optimal choice as a drug for pain management.[60–62] Furthermore, the other qualifying conditions listed by states that are eligible for treatment with cannabis lack evidence of efficacy in controlled clinical trials.[59]

Some researchers and cannabis practitioners suggest that the efficacy of cannabis for a particular health condition is not due to any single component of the plant, but rather due to the synergy and interaction between the three major chemical classes found in *Cannabis sativa*—cannabinoids, flavonoids, and terpenoids. The combined action of the three general classes of chemicals in the plant is referred to as the "entourage effect."[63,64] This holistic approach to cannabis efficacy differs from the accepted pharmacological approach to drug development where a single, molecular candidate chemical is tested for a therapeutic effect on its own.[65]

Some states like Connecticut[66] and Minnesota[67] have established research programs to evaluate the effectiveness of medical cannabis for various qualifying conditions. Research into the medical efficacy of cannabis and its many constituent cannabinoids has been limited because of scientific issues and legal obstacles.

Scientifically speaking, the large number of cannabinoids found in *Cannabis sativa* is a challenge.[5] Determining which cannabinoid is effective for what health condition and at what dosage it will produce the maximum therapeutic benefit is a daunting scientific task. In addition to scientific challenges, there are legal obstacles too. Since 1968, researchers were allowed by the federal government to use cannabis from only one domestic source—a facility at the University of Mississippi under contract with the National Institute on Drug Abuse.[68] In late 2020, the U.S. Drug Enforcement Administration (DEA) amended its regulations to facilitate the cultivation of cannabis for research purposes by growers who can apply and be registered by the DES as licit growers.[69] As a way to overcome these obstacles, some medical cannabis access states like New Mexico provide a process for individuals to petition a medical advisory board to add their particular health condition to the state's current list of qualifying health conditions.[70]

Patient/claimant registration in state's medical cannabis program. A worker who seeks cannabis WCI reimbursement must be registered under the state's medical cannabis access law and administrative regulations. In Connecticut, an individual may only register for a medical cannabis certificate if they are a Connecticut resident and are being treated for a "debilitating medical condition by a Connecticut-licensed physician or advanced practice registered nurse."[55] Cannabis registrations in most medical cannabis access states must be renewed annually, as in Connecticut,[55] or every 3 years, as in New Mexico.[71]

Reasonable and necessary medical care. Each workers' compensation claim for medical benefits must be supported by competent medical opinion and reviewed on a case-by-case basis. Generally, a workers' compensation insurer is only required to cover medical treatment that is "reasonable and necessary." Determining what kind of medical care is reasonable and necessary is an individualized decision made by the treating physician. Given the placement of cannabis as a Schedule I substance under the federal CSA and the lack of approval of cannabis by the FDA, a physician cannot "prescribe," but can only "recommend," cannabis to treat a state-sanctioned qualifying medical condition without jeopardizing the physician's DEA controlled substance/regulated chemical registration certificate.[72]

As the treating physician is the gateway to WCI reimbursement, control over the choice of treating physician might affect a worker's chances of obtaining cannabis WCI reimbursement. Four of the six states where cannabis reimbursement is expressly allowed—Connecticut, Minnesota, New Hampshire, and New York—are "employee-choice" states, that is, the initial choice of the treating physician lies with the employee.[73] However, New Jersey is a strict "employer-choice" state, that is, the employer has the authority to select the treating physician.[73] New Mexico allows the employer to initially select the treating physician or the employer can allow the worker to select their own physician.[73] The party not making the initial choice can then change the treating physician after 60 days or when treatment is judged unreasonable.[74]

In the absence of an extensive portfolio of medical research on the efficacy of cannabis for each condition on the lengthy list of state-sanctioned qualifying health conditions, workers' compensation insurers must rely on the treating physician to make a medical decision about whether cannabis is reasonable and necessary to treat the worker's health condition. Some states provide medical treatment guidelines for use by the treating physician. Connecticut,[75] Minnesota,[76] New Mexico,[77] and New York[78] have adopted specific medical treatment guidelines that healthcare providers must follow. New Jersey has not adopted similar "reasonable and necessary" medical treatment guidelines except in the area of opioid prescribing.[79]

Once cannabis is considered as "reasonable and necessary" treatment on an individualized basis by the treating physician within workers' compensation, WCI reimbursement for cannabis can be authorized. From that point forward, a worker's access to cannabis is guided jointly by the state's medical cannabis access laws and any requirements of the workers' compensation insurer. For states that expressly allow WCI reimbursement, insurers, employers, treating physicians, and workers generally need to pay close attention to that state's medical treatment guidelines. However, even in those states with medical guidelines, there is generally a process to allow a variance from the guidelines based on individualized medical evidence submitted by the treating physician.

Cannabis as medical treatment of last resort. Cannabis is generally considered a treatment of last resort in medical cannabis access states allowing WCI reimbursement. Medical guidelines in these states require the physician to provide evidence that non-cannabis treatment approaches have been ineffective for work-related health condition. For example, Connecticut's medical access rules require that:

> "The qualifying patient's physician or advanced practice registered nurse has issued a written certification to the qualifying patient for the palliative use of marijuana after the physician or advanced practice registered nurse has prescribed, or determined it is not in the best interest of the patient to prescribe, prescription drugs to address the symptoms or effects for which the certification is being issued."[80]

In the case of debilitating chronic pain—a condition common to many workers' compensation cases where cannabis treatment is at issue—medical evidence is required that a combination of non-cannabis treatments like surgery, physical therapy, cognitive and behavioral therapy, and prescription pain medications were tried but were shown to have failed in alleviating the worker's pain. Providing pain management that spares the injured worker the dangers of opioid addiction or overdose has become a key issue in workers' compensation medical care.[81] The emerging risk of multimodel

analgesia with opioid and gabapentinoid drugs have increased attention to alternatives,[82] including heightened interest in recommending cannabis to replace or reduce the opioid dosage.[83] However, evidence of the value of cannabis as an opioid substitute is weak once a worker develops an opioid use disorder.[84]

1.3 | Medical requirements involving cannabis reimbursement

Dosage. Cannabis retail products contain varying levels of Δ^9-THC.[5] The potency of retail cannabis has steadily increased over the past few decades from 4% in 1995[85] to 15% in 2018, as measured from collected samples confiscated by the DEA.[86] Relative to the typical flower-derived products, Δ^9-THC levels in some cannabis concentrate products are in the range of 60%–80%.[87] Even though states' packaging and labeling regulations require that the Δ^9-THC content be displayed on the cannabis product,[88] quality control issues are prevalent in the cannabis retail industry as there are no uniform, authoritative standards for cultivating, processing, testing, or labeling cannabis products for use by consumers.[89]

Unlike a pharmaceutical approved by the FDA, which contains a single molecular ingredient that has a known and predictable therapeutic effect at a given dose level, the effective dose and frequency of administration of cannabis for many health conditions are uncertain.[7] Individuals accessing cannabis from a medical cannabis retail dispensary are encouraged in some cases to monitor the effects of cannabis on the medical condition versus the amount of cannabis taken, taking into consideration the source or strain of cannabis used, how the product is used, for example, vaporized or eaten, and the amount self-administered. For example, the New Mexico Department of Health's Patient Guide provides the cannabis user with the following recommendation:

> "There are many types of products in the market with different uses and effects. The best way to keep track of what is working or not working for you is to write it down… Write down what you tried, if it helped your symptoms and how you felt… If you try something that doesn't feel right for you stop using it. Write it down in your tracker then talk to your medical provider and the dispensary."[71]

Amount supplied. Unlike the uncertainty around dosage, the amount of cannabis that will be reimbursed is easier to specify under a state's medical cannabis access law. There are limits to the amount of cannabis that states allow a consumer to purchase and possess from a state-approved cannabis dispensary, but there is no consistency from state to state. In the six states that allow WCI reimbursement, the amount limits vary.

In New Hampshire, the limit is the shortest ("… a qualifying patient shall not obtain [from the alternative treatment center] more than 2 ounces of usable cannabis… during a 10-day period."[90] In Connecticut, the amount possessed by a qualifying patient should not "exceed an amount of usable marijuana reasonably necessary to ensure uninterrupted availability for a period of one month…".[91] In New Mexico, the limit is 3 months ("adequate supply' means an amount of cannabis… determined by rule of the department to be no more than reasonably necessary to ensure the uninterrupted availability of cannabis for a period of three months and that is derived solely from an intrastate source."[92] New Mexico is the only state to have developed a fee schedule for the amount of cannabis reimbursement allowed.[93]

Ongoing monitoring by treating physician. The treating physician is required to continually assess the worker's condition to determine how well the worker is recovering from their work-related health condition as the primary goal of WCI is to return the worker to productive employment. Minnesota's workers' compensation medical treatment guidelines state that a key treatment concept is "effective care," which means "the patient is improving subjectively, the patient's objective clinical findings are improving and/or the patient's functional status is improving (such as workability)."[76] In addition to a return to workability, physician monitoring of cannabis use is important because cannabis is not without adverse health effects. As a self-administered collection of various botanical substances that lack well-studied dose–effect relationships, cannabis differs significantly from FDA-approved drugs used in workers' compensation medical care.

Acute health effects. Acute health effects of cannabis consumption include lightheadedness, drowsiness, somnolence, dry mouth, nausea and vomiting, euphoria, disorientation, confusion, and hallucinations.[58] Emergency department visits for acute cannabis intoxication can occur, especially for naïve users.[94] The type of acute effects of cannabis consumption can differ by the route of administration. For example, emergency room visits attributable to inhaled cannabis are more frequent than visits attributable to ingested cannabis.[95] Treatment of acute cannabis toxicity is mainly supportive, including cardiovascular and neurological monitoring, placement in a quiet room, and administration of benzodiazepines if agitation is present.[96,97] As cannabis does not affect the respiratory center in the brain like opioids, cannabis toxicity is only rarely associated with death. However, cyclic attacks of nausea and vomiting—called cannabinoid hyperemesis syndrome—have been reported to occur with excessive cannabis consumption.[98] Rarely, cannabinoid hyperemesis syndrome can lead to death.[99]

Chronic health effects. Frequent and heavy cannabis consumption can lead to longer-term physical and psychological dependence.[100] Withdrawal symptoms arising from cessation of heavy use can occur and manifest as anxiety, irritability, insomnia, tremors, and decreased appetite.[101,102] The increasing potency of cannabis, combined with the use of high-Δ^9-THC cannabis concentrate products, "raises concerns that the consequences of cannabis use today could be worse than in the past, particularly among those who are new to cannabis use and in younger users, whose brains are still developing."[103]

In 2013, cannabis abuse and dependence were combined in the American Psychiatry Association's *Diagnostic and Statistical Manual of*

Mental Disorders (DSM-5®) into a single entity capturing the behavioral disorder that can occur with chronic cannabis use called Cannabis Use Disorder (CUD).[104] The DSM-5® defines CUD as a problematic pattern of cannabis use leading to significant impairment or distress, as manifested by at least two of 11 behavioral correlates occurring within a 12-month period.[104] In addition to tolerance and withdrawal, qualifying behaviors for cannabis use disorder include, but are not limited to, the following: the individual uses cannabis in larger amounts or over a longer period than was intended; the user experiences persistent desire or unsuccessful efforts to cut down or control cannabis use; a lot of time is spent in activities necessary to obtain cannabis, use cannabis, or recover from its effects; and the user experiences craving or a strong desire or urge to use cannabis.[104]

Use of medical cannabis in the workplace. Even when a worker succeeds in obtaining cannabis WCI reimbursement, actual use by the worker is associated with many pitfalls involving the role of cannabis in the workplace. For example, no state requires employers to accommodate cannabis use *at* the workplace.[105] Twelve states and the District of Columbia provide antidiscrimination protections to a worker who uses cannabis *outside* the workplace. These are Arizona, Arkansas, Connecticut, District of Columbia, Illinois, Maine, Minnesota, Nevada, New York, Oklahoma, Pennsylvania, and Rhode Island.[106]

A worker can be the subject of disciplinary action if found to be working "under the influence" or "impaired" at work from cannabis use outside the workplace. In some positions covered by federal government workplace drug use rules, an individual with a positive test for cannabis can be subject to disciplinary action even if the individual is not intoxicated or impaired. Under most state laws, if a worker is found to be intoxicated from cannabis at work, "nothing… shall restrict an employer's ability to discipline an employee from being under the influence of intoxicating substances during working hours.[107] Furthermore, an injured worker can see their workers' compensation benefits restricted if they are found to be intoxicated at the time of the incident or if their intoxication is found to be a proximate cause of the incident.[17]

Determining impairment from cannabis use is not straightforward. Urine drug testing for Δ^9-THC or its metabolites is often used to support a determination of impairment, but levels in the urine do not correlate with acute impairment.[108] As cannabis is stored in body fat and released into the bloodstream over days or weeks after its initial use, urine drug levels do not correlate with impairment.[109] Measurement of Δ^9-THC and metabolites in serum or plasma above 5 nanograms per milliliter (ng/ml) may be a better indicator of impairment, but a medical examination focused on identifying impairment is recommended.[110]

1.5 | Comparison with selected Canadian provinces

In 2018, Canada became the second country in the world to formally legalize the production, distribution, sale, and possession of cannabis. The goals of the Canadian Cannabis Act are to (1) keep cannabis out of the hands of youth, (2) keep profits out of the pockets of criminals, and (3) protect public health and safety by allowing adults access to legal cannabis.[111] Despite legalization, cannabis is not an approved therapeutic drug in Canada. Furthermore, Health Canada, the federal health department, does not endorse the use of medical cannabis.[112] While implementation of the Canadian Cannabis Act is on the provincial level, all medical cannabis retailers are licensed federally by Health Canada with standardized rules for product quality, labeling, and other retail aspects. This approach ensures more standardization in dosage, amount prescribed, and duration of treatment across Canada compared to the United States. Increased standardization may also enhance physician prescribing confidence.

Canadian workers' compensation boards (WCBs) are provincially and territorially regulated. Canadian WCBs are similar to the four monopolistic U.S. state funds found in Ohio, North Dakota, Washington, and Wyoming which require employers to purchase workers' compensation coverage from a state government-operated insurance fund. Canadian provincial and territorial WCBs have similar concerns as their U.S. workers' compensation insurers have about the lack of scientific evidence for the efficacy of cannabis for specified health conditions. Concerns about the scope of prescribing cannabis for a variety of medical conditions are reflected in published prescribing guidelines for Canadian physicians.[113] Each provincial and territory WCB has developed its own policy governing cannabis reimbursement for the treatment of work-related health conditions. However, unlike the 36 U.S. states with medical cannabis access, there is generally a more restricted list of qualifying conditions across Canadian provinces and territories. In addition, there is greater harmonization of cannabis medical guidelines across Canadian provincial and territorial WCB policies. The following are examples of cannabis WCB reimbursement from four Canadian provinces.

New Brunswick. New Brunswick was the first province to issue guidance about medical cannabis used as a workers' compensation medical benefit. WorkSafeNB, which oversees New Brunswick's workers' compensation, makes clear that medical cannabis is "generally not a WorkSafeNB approved treatment and will only be approved for… specific medical circumstances."[114] The guidance lists the following health conditions: (1) symptoms encountered in palliative/end of life care setting, (2) nausea and vomiting while receiving chemotherapy as part of treatment for cancer, (3) loss of appetite of injured workers receiving cancer treatment or with AIDS, (4) spasms and spasticity resulting from central nervous system injury, (5) chronic neuropathic pain, and (6) harm reduction (for a worker on an opioid dosage that puts the worker at a high risk of harm).[114] This guidance requires a full risk assessment that includes a "documented review of the potential occupational and worksite risks and potential impact on the work environment and co-workers" as well as "a documented evidence-based review of the potential impact on the individual's ability to perform safety-sensitive tasks in the workplace, including operating a motor vehicle or equipment."[114]

Ontario. Ontario's guidance—*Cannabis for Medical Purposes*—provides coverage for a limited number of medical conditions.

Ontario's designated conditions mirror those specified in New Brunswick, for example, neuropathic pain, spasticity, nausea and vomiting from cancer chemotherapy, anorexia from AIDS, and pain and other symptoms experienced in a palliative setting.[115] Like New Brunswick, Ontario covers cannabis only after all conventional treatments have been exhausted.

Nova Scotia. Nova Scotia's medical guidelines cover health conditions that are identical to New Brunswick and Ontario. Furthermore, Nova Scotia requires that the medical cannabis and route of administration authorized for the worker must satisfy all of the following: (1) route of administration must not involve smoking; (2) daily quantity of dried medical cannabis must not exceed 3 g/day; (3) medical cannabis should be CBD-rich with minimal Δ^9-THC; (4) Δ^9-THC percentage of the medical cannabis must not exceed 9%; (5) milligrams (mg) of Δ^9-THC per day should be no more than 30 mg, but in no case shall exceed 75 mg; (6) daily quantity of dried cannabis must not exceed 3 g/day; (7) if alternate forms are prescribed (i.e., oil), they must be converted to a similar ratio and amount; and (8) cannabis must not be homegrown.[116]

Saskatchewan. Saskatchewan's workers' compensation policy allows medical cannabis for similar medical conditions as the Canadian provinces discussed above, but also allows cannabis for opioid harm reduction for workers experiencing chronic pain. Saskatchewan's policy does not detail specific Δ^9-THC or CBD quantities but notes products must "clearly identify the proportion of active ingredients… and contain an appropriate percent of active ingredients as approved by a Workers' Compensation Medical Officer."[117]

1.6 | U.S. federal legalization

U.S. Marijuana Opportunity Reinvestment and Expungement Act. Of the 36 states and DC that have legalized cannabis access for qualifying medical conditions, 19 states and the District have also legalized cannabis access for nonmedical or recreational use.[118] While the public health consequences of legalizing cannabis on a national level are still being studied,[119] efforts are underway to change U.S. federal law regarding high-Δ^9-THC cannabis by proposing congressional action to remove the broad statutory term "cannabis" from any of the five restricted schedules of controlled substances set forth by the CSA. In 2020, the Marijuana Opportunity Reinvestment and Expungement Act (MORE Act), which would "*deschedule*" cannabis, eliminate criminal penalties for any individual who manufactures, distributes, or possesses cannabis ("*decriminalize*"), and set a 5% federal tax on all cannabis sales, passed the House of Representatives but was not taken up by the Senate.[120] The MORE Act was reintroduced again in the House on May 28, 2021.[121]

U.S. Food, Drug, and Cosmetic Act. Descheduling may remove cannabis from the CSA's Schedule I and oversight by the DEA, but it may not remove cannabis from oversight by other federal government agencies. The Food, Drug, and Cosmetic Act (FDCA) provides the FDA with broad authority over drugs, foods, dietary supplements, medical devices, cosmetics, and tobacco products (FDCA). To the extent that any cannabis constituent or product travels in interstate commerce or falls into one of FDA's regulated categories, it will be subject to FDA's jurisdiction and possible enforcement actions.[65,122]

1.7 | International perspectives

To date, more than 50 countries have adopted medical cannabis access laws. Canada,[111] Georgia,[123] South Africa,[124] and Uruguay[125] have fully legalized the use of cannabis in their countries. On December 2, 2020, the United Nations Commission on Narcotic Drugs approved a recommendation from the World Health Organization to remove cannabis from Schedule IV of the Single Convention on Narcotic Drugs of 1961.[126] By removing cannabis from Schedule IV—where it had been placed 59 years ago and to which the strictest control measures apply—the Commission indicated that it no longer considers cannabis to be among the "particularly dangerous" (Convention Schedule IV) of the most dangerous drugs (Convention Schedule I).[127,128]

2 | CONCLUSION

Although cannabis WCI reimbursement is only allowed in a minority of the 36 U.S. medical cannabis access states, cannabis treatment for work-related health conditions that are unresponsive to conventional medical treatments may increase as more workers petition state courts and administrative agencies for cannabis WCI reimbursement. Descheduling of cannabis on the U.S. federal level would likely accelerate the use of cannabis where it is determined to be a reasonable and necessary treatment for difficult-to-manage work-related health conditions. Anticipating the future trends in the United States and internationally, cannabis use in workers' compensation is an emerging occupational health and safety issue that deserves research attention.

Among the research questions are the following: (1) are there any demographic or health condition differences between workers who are able to obtain cannabis WCI reimbursement compared to workers who cannot obtain cannabis WCI reimbursement? (2) will cannabis-reimbursed workers differ in their rehabilitation outcomes, returning to productive work faster compared to non-reimbursed workers? (3) how will cannabis WCI reimbursement impact opioid overdoses and the risk of developing an opioid use disorder? (4) will workers' compensation insurers that offer cannabis reimbursement experience differences in claim severity? (5) will reimbursed workers have different permanent disability outcomes? (6) how will increased use of cannabis in WCI systems impact workplace safety and health and future incidence of work-related injuries and illnesses? and (7) what are the most effective physician and insurer practices for treating a work-related health condition with cannabis? These and many other research questions associated with the emerging role of cannabis in the medical care of workers with work-related health conditions would benefit from increased research attention.

CONFLICTS OF INTEREST

The authors declare that there are no conflicts of interest.

DISCLOSURE BY AJIM EDITOR OF RECORD

John Meyer declares that he has no conflict of interest in the review and publication decision regarding this article.

AUTHOR CONTRIBUTIONS

The authors conceived and drafted the work, revised it critically for important intellectual content, gave final approval of the version to be published, and agreed to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

DISCLAIMER

The findings and contributions in this report of the authors do not necessarily represent the views of the National Institute for Occupational Safety and Health, the Centers for Disease Control and Prevention, or the US Department of Health and Human Services.

DATA AVAILABILITY STATEMENT

Data derived from public domain resources. The data that support the findings of this study are available online through Google Search. See References [18-128] for Internet access to the source material.

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