

# The Cannabis Craze: What You Need to Know

By Kimberly Hartke

**T**hese days, many voices in social media are lauding cannabis as the cure for almost any ailment. Decades ago, however, the notion of “medical marijuana” was so far-fetched that when the editor of *High Times* magazine jokingly stated at a conference that he smoked pot to prevent glaucoma, the crowd roared with laughter.<sup>1</sup>

Keith Stroup, founder of the National Organization for the Reform of Marijuana Laws (NORML), seized on the idea of “medical pot” because of its political value. In a 1979 interview he gave at Emory University, he stated, “We are trying to get marijuana reclassified medically. If we do that, we’ll be using the issue as a red herring to give marijuana a good name.”<sup>2</sup> Richard Cowan, another leader at the same organization, openly referred to medical marijuana as a “scam” that would help legalize recreational use.<sup>1</sup>

## MODERN-DAY CANNABIS

Cannabis contains two chemical components of medical interest: tetrahydrocannabinol (THC)—the plant’s famous psychoactive component—and cannabidiol (CBD), which is considered non-psychoactive. Both compounds are extracted from the plant’s cannabinoid acids through exposure to heat or other forms of “activation” (called decarboxylation).<sup>3</sup>

The highly fat-soluble cannabinoids in marijuana are stored in the fat (lipid) portion of our cells. While stored in fatty tissue, cannabinoids can continue to affect mental performance, the immune system and other cellular activity after initial exposure. Unlike alcohol, which leaves the bloodstream in four to five hours, the psychoactive components of marijuana can remain in the body for days or weeks, impairing neurological function and reaction times.<sup>4</sup> Thus, daily or weekly users never completely detox from the drug and may be at risk for poor judgment and slowed reactions leading to automobile accidents long after use.

Today’s marijuana is a far cry from the native weed that 1930s jazz musicians used for relaxation. Cannabis potency has been increasing over the past seventy years.<sup>5</sup> In the 1960s, cannabis had a THC content in the range of 0.5 to 3 percent. By the 1990s, the THC content had risen to around 6 to 8 percent, and today most

cannabis flowers sold in dispensaries contain 20 percent or more THC.<sup>6</sup> In fact, cannabis concentrates such as THC butter or hash oil and “shatter” (oil extractions that use butane as a solvent) can reach a THC content of more than 90 percent.<sup>7</sup> *High Times* magazine even sponsors a breeding competition called the Cannabis Cup (“the world’s leading marijuana trade show”), which has taken the 1960s term “flower power” to a whole new level.<sup>8</sup>

A writer for stoppot.org describes the ominous implications of today’s highly potent cannabis (nicknamed “skunk”), which has risen in THC potency from 0.5 percent to 95 percent: “Calling skunk ‘medical marijuana’ in itself is a joke. CBD, the potentially beneficial compound has been largely bred out in favor of THC, the psychoactive ingredient. . . . That is not medicine. It is a lethal weapon. The result has been psychotic episodes. . . and suicides from coast to coast. . . . It is happening to enough young people that Congress should take note and defer to medical science and the FDA as to what constitutes a safe and efficacious medicine.”<sup>9</sup>

## A DRUG, NOT A CURE-ALL

Cannabis has drug-like effects, some of which may be useful in medicine, but it is not a cure-all, and—like all drugs—it has side effects, including addiction. The U.S. Drug

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## ARTICLE SUMMARY

- Cannabis has drug-like effects, some of which may be useful in medicine, but it is not a cure-all.
- Cannabis potency has been increasing over the past seventy years.
- After tobacco and alcohol, cannabis accounts for more dependence than any other drug or drug group, and cannabis use carries considerable risk of psychiatric illness and other serious outcomes.
- The THC in marijuana increases the release of dopamine from the brain and, over time, can lead to serious neurotransmitter imbalances.
- Our bodies produce natural cannabinoids from animal fats in our diet. When well-regulated, these endocannabinoids are “feel-good chemicals” that ensure production of the proper amount of dopamine and cortisol.
- The research on cannabis outcomes for seizure-afflicted individuals is mixed. Seizure disorders often respond well to a diet very high in fats and low in sugar and refined carbohydrates.
- The evidence for marijuana as a pain reliever is also weak.
- Thus far, cancer studies have reached mixed conclusions. Marijuana users exposed to the drug’s potent THC component may be more at risk for cancer, while results for CBD are inconclusive.
- Advocates for medical marijuana often uncritically credit all forms of marijuana and all methods of consuming marijuana as having therapeutic benefits, but patients and providers need to carefully consider dosing, potency, purity, potential adverse effects and other factors before entering this new medical frontier.

Gabriel Nahas actively campaigned against the medicalization of cannabis as a result of his research with populations where use of the drug was widespread and problematic.

Enforcement Administration (DEA) continues to classify cannabis as a Schedule I drug (along with heroin and LSD) precisely because of marijuana's "high potential for abuse" and its addictive qualities (described by the DEA as the "potential to create severe psychological and/or physical dependence").<sup>10</sup> Although cannabis advocates have been pushing hard for a drug schedule change or even complete descheduling—arguing that the DEA "has it all wrong"—a federal court reaffirmed marijuana's Schedule I classification in 2015, opining that medical marijuana had not yet proven its safety and efficacy.<sup>11</sup>

Bertha Madras, PhD, a professor of psychobiology at Harvard Medical School who studies how drugs affect the adolescent brain, gave testimony that convinced the federal judge not to reschedule marijuana. Madras later told *Time*, "Wealthy investors and fierce user-advocates have orchestrated a political campaign to medicalize, legalize and normalize an intoxicating, psychoactive, addictive drug...in the absence of unbiased scientific evidence or adherence to rigorous drug approval processes."<sup>12</sup> Dr. Madras was appointed to the president's commission on Combating Drug Addiction and the Opioid Crisis in 2017.

The late Gabriel Nahas, MD, also actively

campaigns against the medicalization of cannabis as a result of his research with populations where use of the drug was widespread and problematic. Dr. Nahas visited isolated cultures with a high degree of cannabis use and studied the downregulation of the immune system by cannabis. In his 1979 book, *Keep Off the Grass*,<sup>13</sup> he described a colleague's interaction with a high-ranking public health official in Morocco who expressed the belief that cannabis "makes a bed for tuberculosis." Dr. Nahas also wrote about Egypt's request that the United Nations include marijuana in international drug control treaties because of the scourge the drug had become in Egypt.<sup>14</sup>

#### ADDICTIVENESS

In 1994, researchers at the National Institute on Drug Abuse (NIDA), a division of the National Institutes of Health, analyzed drug dependence data from a large national survey conducted with over eight thousand participants aged fifteen to fifty-four years.<sup>15</sup> After tobacco and alcohol, the NIDA authors found that "cannabis accounted for more dependence than any other drug or drug group," with almost one in ten cannabis users reporting (and perhaps under-reporting) dependence. Men were more than twice as likely to become addicted as women

#### CBD

The cannabis industry has aggressively promoted CBD products to naturopaths, health coaches and consumers, claiming that the products can cure everything from cancer to seizures to digestive distress. The increasing availability and apparent popularity of over-the-counter CBD products at health food stores have persuaded many consumers that cannabis is a "go-to" product with fantastic health benefits—which people are taking as a supplement rather than a drug. A typical promotion is CBD softgels given freely as a thank-you gift for help in an online event with the promise of "better mood stability, improved sleep, increased mental sharpness, a generally enhanced sense of well-being, and fewer aches and pains—all without the 'high.'"

While CBD oil taken orally may not be "psychoactive," it definitely has effects on the brain and is associated with side effects. Epidiolex, the first cannabis drug, is a purified form of CBD for the treatment of seizures. The drug comes with precise instructions as to dosage and use, with specific warnings against abrupt discontinuation. "When discontinuing Epidiolex, the dose should be decreased gradually. As with all antiepileptic drugs, abrupt discontinuation should be avoided when possible, to minimize the risk of increasing seizure frequency and status epilepticus." The package insert lists the following side effects: hepatocellular injury, somnolence and sedation, suicidal behavior and ideation, hypersensitivity reactions and withdrawal of antiepileptic drugs.<sup>74</sup>

The findings of K. Watanabe and his research team in Japan indicate further dangers of CBD oil. The team found that when CBD comes in contact with an artificial gastric juice, it is converted into the psychoactive THC.<sup>75</sup> When people ingest cannabis in cakes or cookies containing sugar, or in beverages containing alcohol, the stomach becomes more acidic and more likely to convert relatively benign CBD into more powerful and dangerous THC. Given these findings, it seems that the safest way to use CBD is as an oil on the skin for localized treatment—while always being on the alert for possible side effects.

(12 versus 5.5 percent).

Other research shared by NIDA indicates that about one in six (17 percent) of those who start using marijuana in adolescence become habitual users, and that 25 to 50 percent of daily users are addicted.<sup>16</sup> Analysis of two waves of longitudinal data from approximately thirty to forty thousand individuals participating in the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC) used a structured diagnostic interview to determine cannabis dependence in 25 percent of those who reported using cannabis on a weekly basis in the previous year.<sup>17</sup> Again, men were more likely to be cannabis-dependent than women.

## CANNABIS RISKS

Dopamine is a neuro-compound that signals reward and enhances motivation. Much like other addictive drugs, the THC in marijuana increases the release of dopamine from the brain. Over time, this can lead to serious imbalances of this important neurotransmitter, with excessive cannabis intake adversely resulting in lower dopamine levels in the striatum part of the brain.<sup>18</sup> (The striatum coordinates multiple aspects of cognition, including both motor and action planning, decision-making, motivation, reinforcement and reward perception.) For the cannabis-dependent person, dopamine deficits in the striatum result in cognitive impairment and memory and learning difficulties. Decreased striatal dopamine release also is predictive of subclinical psychopathology.<sup>18</sup>

Research indicates that cannabis use carries considerable risk of psychiatric illness and other serious outcomes. Summarizing ten years of epidemiologic, clinical and laboratory research, a 2009 report in *The Lancet* described a high probability of adverse effects from cannabis use, including “dependence syndrome, increased risk of motor vehicle crashes, impaired respiratory function, cardiovascular disease, and adverse effects...on adolescent psychosocial development and mental health.”<sup>19</sup> Contrary to the notion that cannabis use exerts a calming effect on all users, cannabis also can cause violent behavior<sup>20</sup> and death (see sidebars).<sup>21</sup> Perhaps even more troubling, one study found that cannabinoids can introduce epigenetic changes that

can be passed on to future generations.<sup>22</sup>

Some people are aware that marijuana can cause paranoia during or after use, but many do not realize that the drug is associated with the onset of other disorders and symptoms such as anxiety, depression, social impairment, psychosis and schizophrenia,<sup>23,24</sup> as well as lowering inhibitions to experiment with other substances.<sup>25</sup> The previously cited NESARC survey found that regular cannabis use “uniquely predicted the development of bipolar disorder, panic disorder with agoraphobia, and social phobia” as well as overall declines in mental health.<sup>26</sup>

The Harvard Medical School’s *Family Health Guide* discusses two longitudinal studies that found a link between marijuana and depression.<sup>27</sup> First, a survey of sixteen hundred teenagers in Australia found that young women who had smoked marijuana weekly as teens were twice as likely as non-users to report depression when surveyed seven years later.<sup>28</sup> The second study collected data from nearly two thousand young people in Baltimore in 1980 and followed up with the same respondents from 1994 to 1996.<sup>29</sup> Young women who reported using marijuana daily were five times more likely at follow-up to struggle with depression and anxiety. The study found that cannabis users who showed no signs of depression at the first encounter were four times more likely than initial non-users to report depression fifteen years later.

Scientists know that the introduction of hallucinogenic substances to the brain and bloodstream carries a risk of psychosis—and the higher the level of use, the greater the hazard. Psychosis can entail hallucinations, hearing voices, seeing people who are not there and other breaks with reality, as well as agitation and violent behavior toward oneself or others.

Unfortunately, with the rise of ever more potent forms of cannabis, the risk of psychosis is increasing. A 2015 study in *Lancet Psychiatry* examined first-episode psychotic incidents in over four hundred adults age eighteen and older in south London and found that 24 percent of the cases were related to use of high-potency cannabis (with “high potency” defined as a THC content of around 25 percent).<sup>30</sup> The authors also noted the ready availability of high-potency cannabis in the London area. Other United

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Kingdom researchers have reported an association between high-potency cannabis and “an increased severity of dependence, especially in young people,” with “marked effects on memory and paranoia.”<sup>31</sup>

Marijuana’s links to schizophrenia are also under-recognized by the general public, even though science on the topic is accumulating.<sup>32</sup> A longitudinal study in Finland tracked more than eighteen thousand patients over a sixteen-year period (1987-2003) after their discharge from the hospital for a first diagnosis of substance-induced psychosis; the researchers found that cannabis-induced psychosis led more often to a subsequent schizophrenia diagnosis (46 percent) compared to psychosis resulting from other substances such as amphetamines (30 percent), “hallucinogens” (24 percent) or opioids (21 percent).<sup>33</sup> The substance least likely to lead to schizophrenia was the one most widely used by Finnish patients: alcohol-induced psychosis resulted in schizophrenia in only 5 percent of the cases.

Alan Clough of James Cook University in Australia is a leading expert on substance abuse among Aborigines and other remote populations. In 2009, Clough and fellow researchers reported on their five-year study of heavy marijuana use in three remote Aboriginal communities,<sup>34</sup> describing cannabis use by indigenous Aborigines as “endemic yet neglected.”<sup>35</sup> When Clough spoke about the study with the newspaper *The Australian*, he shared several sobering observations about mental health, noting that “After 15 years of a cannabis epidemic we’re really starting to see the chronic mental effects appearing. We’ve seen acute psychosis that is irreversible, as well as depression and dependence. Unfortunately, we also have the situation where suicide is linked not just with cannabis use but also through withdrawal.”<sup>36</sup>

In August 2018, researchers published the results of the largest known brain scan study in the *Journal of Alzheimer’s Disease*; the study involved over thirty-one thousand participants (ages zero to over one hundred) and over sixty-two thousand scans.<sup>37</sup> The researchers, led by Daniel G. Amen, MD, founder of the Amen Clinics, found that cannabis use, along with schizophrenia and alcohol abuse, were impor-

tant factors related to accelerated brain aging. “The cannabis abuse finding was especially important, as our culture is starting to see marijuana as an innocuous substance,” said Amen, adding that “This study should give us pause about it.”<sup>38</sup> In January of 2019, the *Journal of Neuroscience* published a report indicating higher grey matter volume (GMV) in fourteen-year-old adolescents with very infrequent marijuana use, comparing them to nonusers.<sup>39</sup> Higher GMV is associated with lower performance on the Perceptual Reasoning Index and with future generalized anxiety symptoms.

## CANNABIS AND SUICIDE

The risks of cannabis use for adolescents are particularly worrisome. As Dr. Bertha Madras at Harvard has stated, “This is not a war on drugs: it is a defense of children’s brains.” A study in *Lancet Psychiatry* confirms the importance of protecting young people’s brains to safeguard their future health and well-being. The researchers examined the association of cannabis use before age seventeen with seven different developmental outcomes up to age thirty. They found “clear and consistent associations and dose-response relations between the frequency of adolescent cannabis use and all adverse young adult outcomes.”<sup>40</sup> Youth who had regularly used marijuana were nearly seven times more likely to attempt suicide.

Some of those who start using cannabis as adolescents go beyond attempting suicide to actually succeeding. Lori Robinson, a California parent grieving the loss of her son by suicide, read about Alan Clough’s work with Australian Aborigines and cannabis and took special note of the researcher’s comments about suicide. Gaining immediate insight into the cause of her own son’s death, Robinson coined the term “cannabis withdrawal suicide.”<sup>41</sup> Her son Shane had begun using marijuana and experienced two separate psychotic incidents. He was able to recover from the first episode, but when he later relapsed into further marijuana use, he experienced a second psychotic episode with more lasting consequences to his career and his marriage. Tragically, seven months after his parents got him into rehab and he stopped using the drug, they lost him to suicide.

Andy Zorn, described by his family as “handsome and funny,” began using cannabis in high school out of a desire to fit in socially. He managed to function at a high level for a time, graduating from high school, earning a college associates degree and serving three years in the military. However, his adolescent drug use became an adult addiction that he could not conquer. When he killed himself at age thirty-one, he left a suicide note that read, “Marijuana killed my soul [and] ruined my brain.”<sup>42</sup>

## CANNABIS AND THE HEART

Marijuana can raise both blood pressure and heart rate—sometimes even causing the heart to beat more than one hundred fifty times per minute.<sup>43</sup> In the early 2000s, M.A. Middleman, a Harvard heart disease researcher, studied heart patients to determine possible triggers of acute cardiovascular events like arrhythmias and stroke. Publishing a study in *Circulation*, the researcher noted the rising rate of marijuana use “in the age group prone to coronary artery disease” and concluded, based on research with almost four thousand patients, that marijuana could

trigger acute myocardial infarction.<sup>44</sup> A more recent 2017 review reiterated the association between cannabis and symptoms such as ventricular tachycardia (increased heart rate), high blood pressure and orthostatic hypotension.<sup>45</sup> The authors of the review also noted the potential for sudden death.

In fact, stories of cardiac deaths triggered by cannabis have appeared in the scientific literature. For example, a report by German forensic scientists identified cannabis as the cause of two fatal cardiac-related deaths in otherwise healthy young men.<sup>46</sup> The researchers warned that the public is not adequately aware of marijuana's potential to cause rapid increases in heart rate or blood pressure.

A New Jersey mom, Kristina Ziobro, has gone public with the story of her son, who began self-medicating by smoking cannabis, thinking it might help his irritable bowel symptoms. After becoming an avid advocate for cannabis, the young man died at age twenty-two of heart arrhythmia. The coroner initially told the family that their son's death was likely caused by the cannabis but omitted that opinion from his final report. The Ziobro family believes that cannabis played a significant role in their son's untimely death and is fighting to have the official report

reflect the coroner's initial assessment.<sup>47</sup>

In a case in Colorado, poison control doctors attributed an eleven-month-old baby's death from myocarditis (inflammation of the heart tissue) to probable ingestion of cannabis as the baby's blood and urine tested positive for cannabis.<sup>48</sup> The related news report described a fourfold increase in emergency room (ER) visits by young people who obtain cannabis "edibles" and show up in the ER with "drowsiness, dizziness, vomiting, agitation, dangerous heart rates and seizures."<sup>49</sup>

#### MEDICAL MARIJUANA FOR SEIZURES

Pediatric seizures are one of the most common reasons parents turn to medical marijuana; indeed, many stories on the Internet describe children with intractable seizures who have experienced relief from using CBD products.

### CANNABIS, VIOLENT BEHAVIOR AND PTSD

Dr. Christine Miller, a molecular neuroscientist who studied the causes of psychosis for twenty-five years, offers a download of scientific studies linking marijuana to violence on MomsStrong.org.<sup>76</sup> Author Alex Berenson's new book, *Tell Your Children the Truth about Marijuana, Mental Illness and Violence* exhaustively details the research from around the world proving the link (see page 34). For instance, a study in inner-city Philadelphia in the early 2000s "unexpectedly" found that marijuana users were as likely to engage in violent behavior as crack users, including reckless endangerment, weapons offenses and attempted homicide.<sup>77</sup>

However, two American professors who are often cited by the Drug Policy Alliance (a nonprofit seeking the legalization of all drugs) dispute the scientific consensus and criticize Berenson.<sup>78</sup> Carl Hart of Columbia University and Charles Ksir professor emeritus of the University of Wyoming, in their 2016 review of the science on psychosis concluded that, "Evidence reviewed here suggests that cannabis does not in itself cause a psychosis disorder. Rather, the evidence leads us to conclude that both early use and heavy use of cannabis are more likely in individuals with a vulnerability to psychosis."<sup>79</sup> They note a variety of other problem behaviors (e.g. early or heavy use of cigarettes or alcohol and poor school performance) are associated with violent and aggressive behavior in later years.

On the other hand, Norwegian researchers analyzed data on cannabis use and violent behavior in over two thousand young people in the Norway Longitudinal Study, using statistical methods to determine to what extent the association was causal. Their results imply that a 10 percent increase in cannabis use frequency is associated with a 0.4 percent increase in frequency of violence. Their conclusion: "Analysis of panel data on Norwegian youths reveals a statistically significant association between cannabis use and violence."<sup>20</sup>

Veterans afflicted with post-traumatic stress disorder (PTSD)—who already suffer from flashbacks, nightmares and severe anxiety and depression—are particularly susceptible to alcohol and drug abuse. The cannabis industry, which views veterans with PTSD as a lucrative market for their products, is actively lobbying state and federal legislators to persuade them that PTSD should be a qualifying condition for medical marijuana. However, a study of cannabis use in PTSD sufferers found that the drug made their PTSD symptoms worse, not better, and was associated with more violent behavior and more alcohol use.<sup>80</sup>

Finally, self-harm and violent suicide are other unfortunate results of acute cannabis intoxication in veterans and non-veterans alike. A 2018 study of over three hundred veterans who had deployed to either Iraq or Afghanistan provided evidence that "heavy cannabis use may be a unique risk factor for post-deployment suicide attempts among veterans."<sup>81</sup>

MomsStrong.org provides a forum where parents can share stories of their children's addiction challenges and cannabis-related deaths.<sup>82</sup> These parents represent the most serious pushback against this emerging industry, and we would do well to hear them out.

CBD use decreased seizure frequency to a greater extent than placebos but also was associated with higher rates of adverse events.

However, parents need to know that the research on cannabis outcomes for seizure-afflicted individuals is mixed.

For example, a research team at the University of Colorado studied seventy-five pediatric patients (ages six months to eighteen years) who were using oral cannabis extracts to control epilepsy.<sup>50</sup> Publishing their results in *Epilepsy & Behavior* in 2015, the investigators reported that only one third (33 percent) of the patients responded to treatment (defined as experiencing a greater than 50 percent reduction in seizures), whereas 44 percent experienced adverse events, including increased seizures and one death. (Conventional treatment for seizures typically brings relief to two out of three patients.<sup>51</sup>) Eight of the children had adverse events ordinarily deemed “rare,” including developmental regression, new movement disorders, transient weakness on one side of the body (hemiparesis) and epileptic seizures requiring intubation.

A 2017 clinical trial reported in *The New England Journal of Medicine* shared similarly mixed findings. Studying a specific form of childhood epilepsy called Dravet syndrome (which is characterized by seizures resistant to most other drugs), the researchers found that CBD use decreased seizure frequency to a greater extent than placebos but also was associated with higher rates of adverse events, including serious adverse events in ten of sixty-one patients in the CBD group (versus three of fifty-nine in the placebo group).<sup>52</sup> Eight patients in the CBD group withdrew from the trial due to the adverse events, and another ten reduced their CBD dose. Twelve patients in the CBD group (compared to one in the placebo group) displayed an elevated biomarker indicative of liver damage.

In both studies, the authors concluded that additional data are needed to determine long-term efficacy and safety of CBD for epileptic seizures. Nonetheless, the FDA is moving forward on this front, having reviewed and approved prescription-only Epidiolex, the first CBD pharmaceutical, in June 2018.<sup>53</sup> However, the FDA approval pertains solely to Dravet syndrome and one other rare and severe form of epilepsy.

Seizure disorders often respond well to a

diet very high in fats and low in sugar and refined carbohydrates, the so-called “ketogenic” diet, especially when short- and medium-chain fatty acids (the kind found in coconut oil) are included. Unfortunately, specialists in seizure disorders recommend this diet only “for children whose seizures have not responded to several different seizure medicines.”<sup>54</sup> Since both conventional seizure medications and CBD treatments can have side effects, it makes sense to try dietary intervention *first*, before resorting to any drugs.

#### LITTLE EVIDENCE OF PAIN RELIEF

Pain is another common reason that people give for medicating with cannabis. A humorous quip often heard from drug prevention activists is that “anyone who can fake an ache qualifies for a medical marijuana card.”

What does the science show in terms of cannabis’ effectiveness as a medicine for chronic pain? A 2017 review published in the *Annals of Internal Medicine* suggested that the evidence for marijuana as a pain reliever is weak.<sup>55</sup> The author concluded from the limited data available that cannabis may possibly help with neuropathic and cancer pain but not with other common pain conditions; commenting on the association of long-term cannabis use with adverse mental health effects, the author concluded, “it is not certain that the benefits of medical marijuana are greater than its risks.” A 2018 systematic review of medical cannabinoids in *Canadian Family Physician* reached a similar conclusion, reporting that adverse events are the most consistent effects of medical cannabinoids, and that adverse events can have a greater magnitude of effect than the potential benefits for the conditions targeted.<sup>56</sup> The authors also noted that their methodology underestimated the risk of long-term and serious adverse events, including the risk of psychosis.

A third review, published in 2018 in the journal *Pain*, looked at cannabis extractions used in addition to other pain medications to treat chronic noncancer pain (CNCP). The researchers found that the “number needed to treat to benefit is high, and the number needed to treat to harm is low. . . . It seems unlikely that cannabinoids are highly effective medicines for

CNCP.”<sup>57</sup>

Dr. Ken Finn, a pain medicine expert in Colorado, has stated, “The public has embraced that marijuana can treat all pain conditions and state governments have followed suit, without scientific evidence, and have allowed an industry to prosper on the thin ice of what is currently and scientifically available.”<sup>58</sup> Dr. Finn sees many new patients who come to him already

using high doses of opiates plus marijuana. He explains, “In most cases, the patients admit cannabis does nothing for the pain.” Because opioids and cannabinoids have synergistic effects, Finn counsels his patients that it is dangerous to use them together. A 2018 Australian study published in *Lancet Public Health* found that most patients using opioids who added cannabis were unsuccessful in reducing pain or weaning off opioids.<sup>59</sup>

## CANNABIS AND CANCER

Does cannabis use protect against cancer, or does it cause cancer?

## DON'T FEED YOUR BABIES PSYCHOACTIVE DRUGS

### PREGNANCY

The use of marijuana during pregnancy is contraindicated, and leading health institutions point to a sizeable body of scientific evidence to substantiate such warnings for both mother and child. Unfortunately, many unsuspecting women hear that marijuana is a more “natural” way to deal with the normal symptoms of pregnancy. Marijuana-toking mommies are found in chat groups describing their use of marijuana for morning sickness as preferable to using pharmaceutical drugs. But are there better options? Maureen Diaz, a Weston A. Price Foundation (WAPF) nutrition activist who has given birth nine times, explains how WAPF recommends handling morning sickness: “Lots of high-quality protein, such as grass-fed meat, raw milk and juice from fermented foods and sauerkraut.”

Because THC passes through the placenta into the child, it can interfere with brain development and set a child up for addiction later in life. A study of maternity ward data from thirty-eight states found that over thirty thousand newborns had extended neonatal hospital stays related to maternal substance use in 2012.<sup>83</sup> Most of the babies were going through drug withdrawal.

Proponents of marijuana for morning sickness often cite a Jamaican ethnographic study,<sup>84</sup> but the study has been refuted by a blogger who is staunchly against any drugs during pregnancy.<sup>85</sup> According to the blogger, the Jamaican study was flawed because the researchers did not follow the children long enough; recognizing the cognitive damage done to “marijuana babies” requires observing children in the early primary grades. The blogger goes on to outline her reasons why not to be a “stoner with child.”

### BREASTFEEDING

A mother’s milk is naturally high in fat, and this fat is critical for the baby’s brain development. Out of concern for avoiding contamination of breast milk with THC, hospitals counsel women not to smoke pot while breastfeeding. Since THC is fat-soluble, it accumulates in the breast milk (and organs of the body) and is slow to exit, interfering with brain development.<sup>86</sup>

### BIRTHWEIGHT

Like alcohol and tobacco, marijuana can increase the risk of adverse pregnancy and birth outcomes.<sup>87</sup> Marijuana-smoking mothers are 77 percent more likely to have an underweight baby.<sup>88</sup> Low birthweight can compromise babies’ ability to breastfeed by affecting their ability to suckle and is a significant risk factor for infant mortality. Low birthweight also can have longer-term health consequences. The Aboriginal Cohort Study, a decades-long research project that is monitoring the health of Aborigines who were born low-birthweight, has noted the disproportionate emergence of chronic diseases such as diabetes and obesity in the participants by their mid-to-late twenties.<sup>89</sup> British researchers likewise have found that chronic health problems later in life (as well as premature mortality) are associated with underweight at birth.<sup>90</sup> Pam McColl, a Canadian doula and coauthor of *Baby & Me Tobacco Free*,<sup>91</sup> has stated, “The other harms to children (as they grow) observed by scientific researchers are in these areas: brain maturity, cognitive abilities, executive functioning, short-term memory, verbal outcomes, attention problems, hyperactivity, impulsivity, abstract visual skills, visual reasoning, abstract reasoning, goal setting, planning.”

### PARENTS-TO-BE

The best thing that female marijuana users who want to conceive can do is to stop using the drug, seeking professional help if needed. Prospective fathers also need to consider the risks of marijuana use to their future offspring. The government of Canada says that men who wish to start a family should not use marijuana for any purpose, citing increased risks of testicular cancer and abnormal sperm morphology as well as other reproductive problems.<sup>92</sup> Damage to sperm can result in possible birth defects and an increased risk of childhood cancer.



While marijuana remains illegal according to the U.S. federal government, a frenzied promotion has taken over the marketplace.

A 2016 literature review found that the association of cannabis smoking with lung cancer is inconclusive,<sup>60</sup> but a 2015 study found that marijuana does appear to increase the risk for chronic bronchitis.<sup>61</sup> In a 2012 case-control study, marijuana users had a twofold increased risk of developing testicular cancer compared to nonusers.<sup>62</sup> Assessing cannabinoids as anti-cancer agents, a 2016 review found that THC and CBD induced both *regression* and *progression* of breast cancer in mice.<sup>63</sup> And in 2004, researchers found that risk for glioma (a brain cancer) was increased 2.8-fold in those who smoked marijuana at least once per month, after correcting for cigarette smoking and other factors.<sup>64</sup>

A 2007 study found that THC was a very potent activator of certain cancer-promoting receptors, while CBD gave modest protection.<sup>65</sup> These findings may explain the mixed conclusions of cancer studies so far.

#### THE WILD WEST

While marijuana remains illegal according to the U.S. federal government, a frenzied promotion has taken over the marketplace, targeting not just patients and the alternative health com-

munity but businesses and various marketing models, including multilevel and mail-order marketing. In California, with its open recreational marijuana market, cafes and bars are offering CBD-infused smoothies and cocktails, while California wineries are adding cannabis into their wines and selling them through dispensaries. Two Los Angeles restaurants and pop-up venues serve CBD- and THC-containing food and cocktails, and CBD concentrates are used in the manufacture of “edibles” such as cookies and candy. *Oprah Magazine* even ran a colorful feature story in which the author swooned over a trendy California ladies’ tea party featuring THC-infused teas.<sup>66</sup> Cannabis is also having “a serious moment in the skin care space,” with the promise of cannabis beauty treatments that “get you high.”<sup>67</sup> One beauty salon offers marijuana-infused manicures and pedicures.<sup>67</sup>

Typically, an approved drug will come with dosing instructions as well as warnings about contraindications and side effects, so that both doctors and patients can understand the parameters and risks of the medication. In the Wild West environment in which medical marijuana products and dispensaries are proliferating,

#### NUTRITION AND OUR ENDOCANNABINOID SYSTEM

Our bodies produce cannabinoids from animal fats in our diet. When well-regulated, these endocannabinoids are “feel-good chemicals” that ensure production of the proper amount of dopamine and limit the overproduction of cortisol.

In an article in *Wise Traditions* Winter 2008 issue “The Pursuit of Happiness,” Chris Masterjohn details the way that arachidonic acid, an omega-6 fatty acid found in animal fats in our diet, converts to endocannabinoids.<sup>93</sup> The fat-soluble vitamins A and D work together with arachidonic acid to help humans handle stress and retain the motivation to achieve long-term goals. Masterjohn also explains that when we rely on a drug to address one isolated component of the human body’s complex interacting systems, the drug “often works for a time, but eventually stops working or produces adverse effects.”

External sources of cannabinoids like cannabis are referred to by scientists as “exogenous” cannabinoids. Nora Volkow, a neuroscientist with the National Institute on Drug Abuse (NIDA), explained at a 2015 drug prevention conference in Atlanta that exogenous cannabinoids overwhelm the brain’s cannabinoid receptors and can shut down the body’s natural production of endocannabinoids. In 2016, Volkow and colleagues published a review article in *Nature* that detailed the variable effects of cannabis on the dopamine system from both animal and human studies.<sup>94</sup> While the “high” created by THC initially releases a flood of dopamine, long-term use of the drug actually blunts dopamine response and reduces dopamine synthesis. The effects vary based on the amount of the drug consumed and the part of the brain affected. When cannabis interferes with the dopamine system in this way, the resulting behavioral effects include increased appetite, memory problems, executive dysfunction, decreased motivation, impaired educational and occupational outcomes, negative emotions and severe addiction. Dr. Volkow also has written about the sixfold increase in the risk of schizophrenia associated with abuse of high-THC cannabis, noting that “aberrant dopaminergic function in the midbrain”—a hallmark feature of schizophrenia—“may underlie this association.”<sup>95</sup>

It is so much better to stay balanced, motivated and happy by eating a lot of butter and other animal fats, and by consuming good sources of vitamin A such as cod liver oil, liver and other organ meats! The glycine in nourishing bone broths also helps to regulate dopamine levels. These foods keep us “naturally high” without any need to resort to cannabis and other drugs.

however, dosing instructions and warnings are absent.

Advocates of medical marijuana often uncritically credit all forms of marijuana and all methods of consuming marijuana as having therapeutic benefits, whether smoking a joint, downing a THC-infused soda, eating a marijuana brownie or vaping or “dabbing” highly concentrated THC resin. The average marijuana dispensary lumps all of these together under the mantle of “medicine.”<sup>68</sup> The online cannabis marketplace also lacks standardization and quality control, with a high rate of mislabeling CBD and THC content.<sup>69</sup>

Contamination represents another serious concern. Recent laboratory tests of retail cannabis products in California found that 80 to 90 percent of the products contained pesticides, fungus and mold—potentially dangerous toxins, especially if inhaled.<sup>70</sup> Voters in the state ushered in licensed medical marijuana dispensaries two decades ago, yet these recent tests prove that the state is incapable of protecting consumers from contaminated products. In fact, even after media reports of the lab tests, California allowed dispensaries to continue selling the contaminated products for six months rather than forcing a recall. Even if CBD does turn out to hold promise as a medicine for those with rare seizure disorders, users should have access to purified preparations that do not contain harmful contaminants.

Because the side effects of CBD can potentially be serious, parents should not strike out on their own on this new medical frontier. It is important to work under a doctor’s supervision so that treatment with CBD can be altered or terminated if necessary. As new information emerges about the patient characteristics (whether genetic or physiological) that may increase the risk of adverse events, the responsibility for evaluating the research and advising physicians regarding cannabis use for medical purposes should remain at the federal level rather than playing out in piecemeal manner state by state.

William Bennett, MD, wrote the following to the FDA: “In 1986, we lost a 22-year-old son at the University of Oregon due to a dose of cocaine taken in a fraternity. We hope that

the Food and Drug Administration will use the same criteria with crude marijuana as medicine that they use for any other therapeutic substance. We need scientific proof of efficacy and safety in well-controlled clinical trials. Further, insistence on exact dosing, standardization of preparation, avoidance of contaminants, and evaluation of the smoking method of drug delivery needs to be done. Clearly crude cannabis contains many ingredients, and this will be almost impossible to standardize for clinical use.”

## THE PUSH FOR LEGALIZATION

Groups like the Drug Policy Alliance and Marijuana Policy Project continue to lobby state officials to legalize cannabis. However, policy-makers, voters and health-conscious consumers would be well-advised to become better informed about the personal, economic and social costs related to cannabis legalization and thoroughly analyze the medium-range and long-term consequences. Moreover, many of the assertions put forth by pro-pot organizations (such as “it is not addictive” and “it never killed anyone”) are so patently false that they should call into question the organizations’ sweeping medical claims. It’s true that laws against marijuana use have unnecessarily targeted minorities and the poor, often resulting in unjustly harsh prison sentences. But legislators and citizens need to consider carefully the possible effects of removing all laws against the sale and use of marijuana.

Colorado is a revealing test case that may help legislators evaluate the wisdom of allowing similar policies to spread throughout North America. Commercialization of medical marijuana exploded in Colorado beginning in 2009, with favorable health board and legislative rulings allowing the emergence of over five hundred approved dispensaries by 2012 (and hundreds of unlicensed dispensaries) as well as over one hundred and eight thousand registered medical marijuana “cardholders” as of that year.<sup>71</sup> A report from the Rocky Mountain High Intensity Drug Trafficking Area (RMHIDTA) extensively describes the downside of Colorado’s rush to embrace commercial cannabis, covering many adverse impacts. These include statistics on impaired driving, traffic fatalities, youth and adult use, emergency department and hospital admissions and diversion of Colorado marijuana to other states.<sup>71</sup> Health care providers interviewed for the report describe “debilitating” symptoms, lives that have been “completely disrupted” and well-documented cases of psychosis. There has also been a 65 percent increase in first-time marijuana use among Colorado youth since legalization.<sup>72</sup>

In California, the “Silent Poison”<sup>73</sup> website describes a neglected aspect of the state’s booming marijuana cultivation, outlining widespread devastation of the state’s ecology. Environmental hazards include heavy use of agricultural chemicals and pesticides and massive pollution of waterways. Other problems described on the website include grower ties to transnational criminal organizations and increased risks of violent robberies and other crimes.

One advocacy group, Smart Approaches to Marijuana (SAM), encourages medical research into cannabis but discourages outright legalization. Concerned with the potential for negative public health outcomes, SAM has lobbied for caution in embracing cannabis as a “wonder drug”

## MORE STUDIES ON CANNABIS AND MENTAL ILLNESS

“The association between level of cannabis consumption and development of schizophrenia during a 15-year follow-up was studied in a cohort of 45,570 Swedish conscripts. The relative risk for schizophrenia among high consumers of cannabis (use on more than fifty occasions) was 6.0 (95 percent confidence interval 4.0—8.9) compared with non-users. Persistence of the association after allowance for other psychiatric illness and social background indicated that cannabis is an independent risk factor for schizophrenia...” [www.thelancet.com/journals/lancet/article/PIIS0140-6736\(87\)92620-1/fulltext](http://www.thelancet.com/journals/lancet/article/PIIS0140-6736(87)92620-1/fulltext)

“Cannabis use is associated with an increased risk of developing schizophrenia, consistent with a causal relation. This association is not explained by use of other psychoactive drugs or personality traits relating to social integration.” [www.bmj.com/content/325/7374/1199](http://www.bmj.com/content/325/7374/1199)

This population-based prospective study showed that a baseline history of cannabis use increased the risk of a follow-up psychosis outcome for subjects with a lifetime absence of psychosis, with a dose-response relation between exposure load and psychosis outcome. <https://academic.oup.com/aje/article/156/4/319/112397>

“Our findings show the importance of raising public awareness of the risk associated with use of high-potency cannabis. . . especially when such varieties of cannabis are becoming more available.” [www.thelancet.com/journals/lanpsy/article/PIIS2215-0366%2814%2900117-5/fulltext](http://www.thelancet.com/journals/lanpsy/article/PIIS2215-0366%2814%2900117-5/fulltext)

“Multiple linear regression analyses showed that cannabis users by age 15 and by age 18 had more schizophrenia symptoms than controls at age 26. These results remained significant after psychotic symptoms at age 11 were controlled for. The effect was stronger with earlier use.” [www.bmj.com/content/325/7374/1212](http://www.bmj.com/content/325/7374/1212)

“After adjustment for age, sex, socioeconomic status, urbanicity, childhood trauma, predisposition for psychosis at baseline, and use of other drugs, tobacco, and alcohol, cannabis use at baseline increased the cumulative incidence of psychotic symptoms at follow up four years later.” [www.ncbi.nlm.nih.gov/pubmed/15574485](http://www.ncbi.nlm.nih.gov/pubmed/15574485)

“These data indicate that Delta-9-THC produces a broad range of transient symptoms, behaviors, and cognitive deficits in healthy individuals that resemble some aspects of endogenous psychoses.” [www.ncbi.nlm.nih.gov/pubmed/15173844](http://www.ncbi.nlm.nih.gov/pubmed/15173844)

“Cannabis use is likely to increase the risk of developing schizophrenia and other psychoses; the higher the use, the greater the risk.” [www.nationalacademies.org/hmd/Reports/2017/health-effects-of-cannabis-and-cannabinoids.aspx](http://www.nationalacademies.org/hmd/Reports/2017/health-effects-of-cannabis-and-cannabinoids.aspx)

After correcting for history of mood disorders like depression, researchers found that adolescent cannabis use increased the odds of suicide attempts 7-fold. [www.ncbi.nlm.nih.gov/pubmed/25273309](http://www.ncbi.nlm.nih.gov/pubmed/25273309)

“Daily [cannabis] use before age 17 substantially increased odds of later suicide attempts (odds ratio 6.83).” [www.thelancet.com/journals/lanpsy/article/PIIS2215-0366\(14\)70307-4/fulltext](http://www.thelancet.com/journals/lanpsy/article/PIIS2215-0366(14)70307-4/fulltext)

“Statistical significant associations were found between physical aggression and alcohol and/or marijuana use.” <https://journals.sagepub.com/doi/full/10.1177/0886260512468234>

A 2016 paper in *Psychological Medicine* examined marijuana use and criminal behavior among over 400 boys in London, who were followed for more than 40 years beginning in 1961. The boys were surveyed when they were 18, 32, and 48 years old. Researchers found that marijuana at all three ages was associated with a 9-fold increase in violent behavior, even after adjusting for other variables. <https://www.cambridge.org/core/journals/psychological-medicine/article/continuity-of-cannabis-use-and-violent-offending-over-the-life-course/F8E66EC005BDA73865872BD1F398A567>

Individuals meeting the diagnostic criteria for marijuana dependence were 3.8 times more likely than control subjects to be violent. <https://pdfs.semanticscholar.org/3928/d437180cb086857cc665fbb4ba185d624.pdf>

Note: These research studies are from the work of Dr. Christine Miller and author Alex Berenson. See: <http://momsstrong.org/honorary-advisor/> and <http://www.alexberenson.com/>.

and recreational substitute for alcohol. SAM's March 2018 report *Lessons Learned from Marijuana Legalization in Four U.S. States and D.C.* says on the first page that "today's highly potent marijuana represents a growing and significant threat to public health and safety, a threat that is amplified by a new marijuana industry intent on profiting from heavy use."<sup>72</sup> The report also notes that in the four states (and the District of Columbia) that have legalized cannabis, "past-month use of the drug has continued to rise above the national average among youth aged 12-17."

#### CAUTION ADVISED

Like opium and cocaine, marijuana and similar psychoactive plants have played a role in traditional cultures—opium gum, taken directly from the poppy flower and not manipulated in any way, soothed the pains of the elderly in the Middle East, and a tea of coco leaves helped the peoples of the Andes Mountains survive in the rarified altitude. But these forms of the plants are a far cry from the concentrates and extracts that cause so much havoc today. Today's marijuana, bred to have a highly concentrated level of THC, demands caution. These plants all have medical uses—as anyone who has taken morphine to relieve the pain of kidney stones or a gallbladder attack can attest. However, many of the conditions that cannabis is said to help—from anxiety to insomnia—often disappear with improved nutrition (see "Nutrition and Our Endocannabinoid System," page 32). If psychoactive drugs, including cannabis, are truly needed, they require supervision by a qualified health professional well aware of the potential dangers. ☉☉

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A Message  
to Grandparents



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## A Message to Grandparents

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