

HOUSE FEDERAL AND STATE AFFAIRS COMMITTEE

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Support Oppose Neutral

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House Federal and State Affairs Committee
Rep. John Barker, Chair
Written Testimony in support of HB 2184

Thank you for allowing me to submit this written testimony regarding the public policy implications concerning the legalization and regulation of medical cannabis.

By way of introduction, I am Dr. Chad Issinghoff, MD. I am a life long Kansan, born in Topeka, raised near Spearville in southwest Kansas. I received my undergraduate degree in Chemistry and Psychology from Fort Hays State University and my doctor of Medicine degree from the University of Kansas School of Medicine. I completed my Residency in Pediatrics in 1986. From August 1986 until July 1, 2020, I practiced Pediatrics at the Hutchinson Clinic in Hutchinson Kansas. I am currently retired.

I am in support of the legalization and regulation of medicinal cannabis in the State of Kansas.

The use of cannabis-derived medical products grows more popular each year despite its controversial nature. Currently, 36 states have passed legislation regarding the use of medical cannabis products. Physicians, in general, are encountering patients that use cannabis-based products for a wide range of conditions. Many patients will conceal their medical cannabis use because of the associated legal stigma. However, it is crucial that physicians speak to their patients concerning their use of medical cannabis to avoid potential adverse effects and drug interactions. It is imperative to equip physicians with the resources to provide patients with the best recommendations for safe and appropriate use of cannabis-based products. Legalization of medicinal cannabis would assist in removing this barrier.

I view medicinal cannabis, at this time, as an adjuvant to conventional medical therapy. By that I mean, medical cannabis can compliment, or may at times decrease or replace conventional pharmacological management for a host of diseases.

There are several issues I would like to address as a medical professional.

Issue 1: Physician education

As with any medication, the recommending authority (physicians, nurse practitioners, or physician assistants) should have a working knowledge of the endocannabinoid system, the products available, and the potential risks and potential benefits of recommending cannabis. This would include, as in any pharmacologic intervention, the interaction of cannabis and other medications the patient may be on at the time.

Continuing medical education programs concerning cannabis are available. They are affordable, and give a good basis for recommending medicinal cannabis. I have completed two of these courses. The Medical Cannabis Institute program is

comprehensive and takes about 15 hours to complete. The other is a course from Medical Marijuana 411. It is slightly less rigorous, taking approximately 10 hours to complete. It also has associated review material for legislation from 5 States. I took the Utah certification course and it was a good introduction and review of the Utah law and regulations. There maybe other courses available that would be suitable for this educational purpose.

Issue 2: The Effectiveness of Medicinal Cannabis.

While medicinal cannabis is not a medical panacea, the potential use of cannabis-based products is broad. In the 2017 report *The Health Effects of Cannabis and Cannabinoids: The Current State of Evidence and Recommendations for Research* an expert, ad hoc committee of the National Academies of Sciences, Engineering, and Medicine presents nearly 100 conclusions related to the health effects of cannabis and cannabinoid use (Appendix 1).

Their findings reveal:

There is conclusive or substantial evidence that cannabis or cannabinoids are effective:

- For the treatment for chronic pain in adults (cannabis)
- Antiemetic effect in the treatment of chemotherapy-induced nausea and vomiting (oral cannabinoids)
- For improving patient-reported multiple sclerosis spasticity symptoms (oral cannabinoids)

There is moderate evidence that cannabis or cannabinoids are effective for:

- Improving short-term sleep outcomes in individuals with sleep disturbance associated with obstructive sleep apnea syndrome, fibromyalgia, chronic pain, and multiple sclerosis (cannabinoids, primarily nabiximols)

There is limited evidence that cannabis or cannabinoids are effective for:

- Increasing appetite and decreasing weight loss associated with HIV/AIDS (cannabis and oral cannabinoids)
 - Improving clinician-measured multiple sclerosis spasticity symptoms (oral cannabinoids)
 - Improving symptoms of Tourette syndrome (THC capsules)
 - Improving anxiety symptoms, as assessed by a public speaking test, in individuals with social anxiety disorders (cannabidiol)
- Improving symptoms of posttraumatic stress disorder (nabilone; one single, small fair-quality trial) There is limited evidence of a statistical association between cannabinoids and better outcomes (i.e., mortality, disability) after a traumatic brain injury or intracranial hemorrhage

There is limited evidence that cannabis or cannabinoids are ineffective for:

- Improving symptoms associated with dementia (cannabinoids)

- Improving intraocular pressure associated with glaucoma (cannabinoids)
- Reducing depressive symptoms in individuals with chronic pain or multiple sclerosis (nabiximols, dronabinol, and nabilone)

Studies regarding the use of medicinal cannabis-are limited usually to studies of small numbers of patients, observational studies, reviews of a number of small studies, case studies, or anecdotal reports. The results of these studies are often mixed in regards to therapeutic effects of medicinal cannabis. Medical research in medicinal cannabis is limited by 4 factors according to the National Academy of Sciences, Engineering and Medicine 2017 article (Appendix 1):

Overall, according to the National Library of Medicine, since the 2017 report, there have been approximately 250 articles on the safety of medicinal cannabis, approximately 1400 articles on the effectiveness of medicinal cannabis, and approximately 2700 reports on medical cannabis in general.

Obviously we do not have the rigorous studies and “gold standard” proof of the benefits and risks of medicinal cannabis, I believe there is enough evidence to support its use as an alternative/complementary medicinal intervention.

Issue 3: What diagnoses have been reported to benefit from medicinal cannabis

The list of diagnoses is lengthy and fairly extensive. A State-by-State listing is available in Appendix 2. However, no list will be complete in or of itself. There will always be other ailments or diagnosis that will not be included.

One of the primary goals of medicinal cannabis legislation should be qualifying those patients who may benefit from medicinal cannabis in a timely, efficient manner.

Thus, there should be sufficient leeway in order for physicians to qualify patients for medicinal cannabis cards in a timely fashion. For example: In California, the regulation states that a “patient may qualify for medicinal cannabis for any debilitating illness where the medical use of marijuana has been deemed appropriate and has been recommended by a physician.” Whereas, in Utah the regulations state, “If the patient does not have a qualifying condition specifically named, they may petition the Compassionate Use Board for approval of their medical cannabis card.”

Another point to address concerns patients whose physician, may choose not be certified, but desires to recommend medicinal cannabis to their patients. In those situations, a patient should have the ability to consult with another physician to qualify for medical cannabis. However, the consulting physician would still be responsible for reviewing the medical record and interviewing the patient.

Issue 4: What safeguards should be in place to prevent the over-recommendation of medicinal cannabis?

Several layers of safeguards should be put in place in order to prevent medicinal cannabis “mills”. These can include, but are not limited to:

1. Certification of the prescriber after completing the appropriate education course.
2. The assignment of a provider number to those qualified prescribers, much like a DEA number.
3. The ability to track the number of recommendations made by a physician within a 3, 6, or 12 month period. When there appears to be aberrancy in the number of recommendations made by a prescriber, that prescriber should be audited. If the prescriber does not have the required documentation, then some type of action should be taken.

Issue 5: Pediatric Usage of Medical Cannabis

As a pediatrician, I know of the three indications for medicinal cannabis in the pediatric population: The intractable seizures of Lennox-Gestalt and Dravet's Syndrome and persistent nausea associated with chemotherapy.

However, there may be other instances where medicinal cannabis may be appropriate for the pediatric patient. While there are concerns about the use of medical cannabis on the developing brain in childhood and adolescents, there may be a greater benefit than risk in certain illness, in particular, severe spastic quadriplegia (Cerebral Palsy) and severe autism. Medicinal cannabis may be beneficial in helping to improve the spasticity of cerebral palsy and some of the behavioral manifestations of these diagnoses, in particular aggression and sleep disorders.

Outside of those situations, the need for medical cannabis in the pediatric population would be very limited. Any new conditions related to medicinal cannabis use in a pediatric patient should be treated on an individual basis.

Issue 6: The impact of recreational cannabis on medicinal cannabis

Many people often equate medicinal cannabis with recreational cannabis. This is a common misconception especially since most studies on safety, crime, and addiction are primarily done in states that have legalized recreational use. There are few studies from medicinal cannabis only states regarding these issues. (4) (Appendix 3)

The major difference between medicinal and recreational cannabis lies in 3 key factors: First, medicinal cannabis has more stringent regulations for production. The production is controlled for indoor growth with tight control on the agents used to maximize growth. This minimizes the exposure of toxic chemicals to patients. Second; the tracking of cannabis from plant to dispensing is tightly monitored. This requires sophisticated software that is not seen in recreational use. Third; the quality of product is higher in medicinal cannabis. Medicinal cannabis is normally tested in an independent lab and labeled for content, purity, and concentration of particular components. Therefore, the argument that recreational cannabis is a substitute for medicinal cannabis is misguided.

So, while recreational cannabis maybe a greater revenue generating option for states, it falls short of being a substitute for medicinal cannabis.

I would also like to address some misconceptions and misrepresentations that I hear frequently regarding medicinal cannabis.

Misconception 1: Physician's will not discuss or recommend medicinal cannabis to patients because it is illegal Federally. After an extensive search as I am able to perform, I could find no Federal case of a Physician prosecuted for discussing or recommending medicinal cannabis. In my opinion, this is a straw man argument. Most if not all health care providers are willing to discuss alternative/complimentary medical options to their patients.

Misconception 2: There is no standardized dosing for medicinal cannabis products. This is partially correct. However, there are other medications that are commonly used that do not have standardized dosing. In my former practice, medications such as prescribed for Attention Deficit Hyperactivity Disorder are similar in regards to dosing. We start at minimal dosing and increase dosing slowly to one of three endpoints;

- 1; we get to the desired effect,
- 2; we get to a maximum dose, or
- 3; we have adverse effects.

This "Start Low and Go Slow" is the same method that should be applied to medical cannabis patients.

In addition, with regards to standardized dosing, an individual's response to a medication is likely influenced by genetic factors. Genetic directed pharmacotherapy is rapidly become part of the standard of care in prescribing particular classes of medication.

Misconception 3: There are no pharmaceutical standard preparations. Again this is technically true. It is also misnomer to assume that medicinal cannabis content is not tested. For example, in Colorado, 3rd party laboratories test cannabis products and products are labeled for % content of THC and CBD by weight. Furthermore, cannabis-derived consumables may in fact, have standardized content labeling. Growing Standards must also be applied cannabis propagated for medicinal use to avoid contamination with other chemical agricultural products, i.e. pesticides, fungicides, etc.

Misconception 4. There are pharmaceutical grade cannabis-based derivatives that could be used other than medical cannabis. Again this is true but we need to examine the cost of these medications.

A. *Marinol* is a synthetic THC, which has been used in the treatment of chemotherapy induced nausea and appetite stimulation. Results are mixed regarding its efficacy. The estimated cost of Marinol is **\$800 per month or approximately \$10,000 per year.**

B. *Sativex* is currently in phase three trials in the US. It is available in Canada at the present time. Sativex is a 1:1 mixture of THC and CBD (cannabidiol). Its specific indication is for pain relief in Multiple Sclerosis. **Average cost in Canada is approximately \$400 per month.**

C. *Cesamet* is a synthetic THC that is virtually identical to Marinol. It has the same indications for use. The average cost dependent on dosage is **\$80 - \$240 per day or \$2,400-\$7,200 per month.**

D. *Epidiolix* is a CBD product that has specific indications for treatment of 2 specific pediatric seizure disorders, Dravet syndrome and Lennox-Gastaut syndrome. **The cost is approx. \$32,000 per year.**

A concurrent issue involving the prescription of Marinol, Cesamet, Sativex, and Epidiolex, are the indications for use. These medications have specific FDA indications for use. Prescription of these medications for other reasons constitutes “off-label” use and places the physician in a position of increased liability if adverse effects develop.

Misconception 5. There is an increased incidence of addiction with legalized medicinal cannabis. I believe this is a misrepresentation of the current data. Certainly addiction is a serious problem. There is no disagreement that illegal drug use is rampant. When we look at cannabis addiction specifically, several dynamics emerge.

A) In states that have legalized recreational use, the incidence of addiction increases. There is no evidence that I have found, that support the same increase in cannabis addiction in states where only medicinal cannabis is legalized.

B) The addiction issues with cannabis seem to be age related as studies show that those between 13-18 years of age are the mostly likely to become addicted. It appears to me that the use of cannabis and related cannabis addiction occurs most frequently in age groups where cannabis use is already illegal. Further more there appears to be no evidence that the legalization of medicinal cannabis increases the overall use of cannabis. A study released in journal *Addiction* (v113; 473-484) argues that the increase in cannabis use is driven the increasing societal approval than by the legalization of cannabis.

C) Cannabis is less addictive than other substances or behaviors we encounter both illegal (heroin, cocaine, methamphetamine), legal (Prescription pain medications) and behavioral (Tobacco products, caffeine, gambling, high fructose corn syrup).

Misconception 6. Finally there is the argument that legalization of medicinal cannabis increases property crime.

An article from the *Journal of Economic Behavior and Organization* (2018) found “no causal effect of medicinal marijuana on violent or property crime at a national level.” In addition, “there were no strong effects within individual States except California which reported a 20% decrease in violent and property crime.”

Furthermore, more recent reports that Adult use cannabis laws are not associated with an uptick overall criminal activity. (Appendix 3)

I do not believe that medicinal cannabis is a medical panacea. Nor do I believe that the State of Kansas is opening a Pandora's box if medicinal cannabis is approved. I do believe that medicinal cannabis might offer to those who suffer from chronic illnesses, some benefit in reducing symptom severity, a decrease in conventional medication side effects, increased ability to tolerate a wide variety of symptoms, and to better function in society. Until research finds a better path to medications to assist these individuals, medicinal cannabis offers a relative safe alternative to the "poly-pharmacy" treatment of these conditions.

I think it is time for Kansas to adopt medicinal cannabis. Well thought out legislation that includes, continuing education for medical professionals, strong regulation regarding the cultivation, processing, and dispensing aspects of medicinal cannabis, safeguards to minimal misuse, up-to-date tracking systems to monitor sales and usage, and high quality, 3rd party testing, would insure that Kansas could be and should be at the forefront of the use of medicinal cannabis.

Thank you for your time and consideration in this important matter.

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Appendix 1

Qualifying health conditions for medical marijuana from state to state.

Patients with one of these conditions can work with a doctor to get the necessary approval to buy and use medical cannabis. Here are the qualifying health conditions found for **medical marijuana dispensaries** by state.

Alabama

Alabama has very narrow medical marijuana laws. The state only allows CBD products. Qualifying health conditions include:

- Debilitating epilepsy

Alaska

Alaska allows medical and recreational cannabis. Here are the health conditions that qualify for medical marijuana in Alaska:

- Cachexia Cancer
- Chronic pain Glaucoma
- HIV or AIDS Nausea
- Multiple sclerosis Seizures

Arizona

Arizona failed to legalize recreational cannabis in 2016. But the state does have a medical marijuana program. Here are the qualifying conditions:

Alzheimer's disease	ALS
Cachexia	Cancer
Chronic pain	Crohn's disease
Glaucoma	Hepatitis C
HIV or AIDS	Nausea
PTSD	Seizures
Persistent muscle spasms	

Arkansas

In 2016, voters in Arkansas approved new medical marijuana laws. In August 2017, the state received its first dispensary application. Qualifying health conditions for medical marijuana in Arkansas include:

ALS	Alzheimer's disease
Cachexia	Cancer
Chronic or debilitating disease	
Crohn's disease	Fibromyalgia
Glaucoma	Hepatitis C
HIV/AIDS	Intractable pain
Multiple sclerosis	PTSD
Peripheral neuropathy	
Seizures	Severe arthritis
Severe nausea	Severe and
Persistent muscle spasms	
Tourette's syndrome	
Ulcerative colitis	

- Any medical condition or its treatment approved by the Department of Health

California

California has one of the largest, most active medical marijuana programs anywhere. Patients with these conditions can qualify for a medical marijuana card:

Anorexia	Arthritis
Cachexia	Cancer
Chronic Pain	HIV or AIDS
Glaucoma	Migraine
Persistent Muscle Spasms	
Severe Nausea	
Seizures	

California (cont.)

Any debilitating illness where the medical use of marijuana has been “deemed appropriate and has been recommended by a physician.”

Colorado

Like California, Colorado has a longstanding medical marijuana program. That program is complemented by a strong recreational presence. Here are the qualifying conditions:

- Cachexia
 - Cancer
 - Chronic pain
 - Chronic nervous system disorders
 - Glaucoma
 - HIV or AIDS
 - Nausea
 - Persistent Muscle Spasms
 - Post Traumatic Stress Syndrome
 - Seizures
-

Connecticut

Connecticut’s medical marijuana program was signed into law in 2012. Here are the qualifying conditions:

- Amyotrophic lateral sclerosis
- Cachexia
- Cancer
- Cerebral Palsy
- Complex regional pain syndrome
- Crohn’s disease
- Cystic Fibrosis
- Epilepsy
- Glaucoma
- HIV or AIDS
- Intractable spasticity
- Irreversible Spinal Cord Injury with Objective Neurological Indication of Intractable Spasticity

- Multiple Sclerosis
 - Parkinson’s Disease
 - Post-surgical back pain with a condition called chronic radiculopathy
 - Post-laminectomy syndrome
 - Posttraumatic Stress Disorder (PTSD)
 - Severe psoriasis and psoriatic arthritis
 - Sickle cell disease
 - Terminal Illness Requiring End-Of-Life Care
 - Ulcerative colitis
 - Uncontrolled Intractable Seizure Disorder
 - Other medical conditions may be approved by the Department of Consumer Protection.
-

Delaware

Delaware passed the Delaware Medical Marijuana Act in May 2011. Since then, it’s served patients with the following conditions:

- Alzheimer’s disease
 - Amyotrophic Lateral Sclerosis
 - Cachexia
 - Cancer
 - Chronic pain
 - HIV/AIDS
 - Intractable epilepsy*
 - Nausea
 - Post-traumatic Stress Disorder (PTSD)
 - Seizures
 - Severe and persistent muscle spasms
-

Florida

After new medical marijuana laws passed in the 2016 elections, Florida's program has been going through significant changes. Here are the qualifying conditions in Florida:

- ALS
- Cancer
- Crohn's disease
- Chronic nonmalignant pain*
- Epilepsy
- Glaucoma
- HIV/AIDS
- Multiple sclerosis
- Muscle spasms
- Parkinson's disease
- PTSD
- Seizures
- Terminal illness (patients diagnosed with no more than 12-months to live)
- Other debilitating medical conditions comparable to those enumerated

Georgia

Georgia is not known for being very liberal when it comes to cannabis laws. In Georgia, patients can only use certain CBD products that are extremely low in THC. Here are the qualifying health conditions for the state's limited medical marijuana program:

- AIDS
- Alzheimer's disease
- Amyotrophic Lateral Sclerosis
- Autism
- Cancer
- Crohn's disease
- Hospice care patients
- Mitochondrial disease

- Multiple sclerosis
- Parkinson's disease
- Severe or end-stage Peripheral neuropathy
- Seizure disorder
- Sickle cell disease
- Tourette's syndrome

Hawaii

There has been a flurry of medical marijuana activity in Hawaii in recent years as the state issued multiple licenses for new medical marijuana dispensaries. Here are the state's qualifying health conditions:

- Cachexia
- Cancer
- Chronic pain
- Crohn's disease
- Epilepsy
- Glaucoma
- HIV or AIDS
- Lupus
- Multiple sclerosis
- Nausea
- Persistent muscle spasms
- Post-traumatic stress
- Rheumatoid arthritis
- Seizures

Illinois

Illinois has a robust medical marijuana program. The state also chose to decriminalize cannabis in 2016. Qualifying conditions include:

- Alzheimer's disease
- Amyotrophic Lateral Sclerosis (ALS)
- Arnold Chiari malformation
- Cachexia/wasting syndrome
- Cancer
- Causalgia

Illinois (cont)

- Chronic Inflammatory Demyelinating Polyneuropathy
- Complex regional pain syndrome type 2
- Crohn's Disease
- Dystonia
- Fibromyalgia
- Fibrous dysplasia
- Glaucoma
- Hepatitis C
- HIV/AIDS
- Hydrocephalus
- Hydromyelia
- Interstitial Cystitis
- Lupus
- Multiple Sclerosis
- Muscular Dystrophy
- Myasthenia Gravis
- Myoclonus
- Nail-patella syndrome
- Neurofibromatosis
- Parkinson's disease
- Post-traumatic stress
- Reflex Sympathetic Dystrophy (RSD)
- Rheumatoid Arthritis
- Sjogren's syndrome
- Spinal cord disease
- Spinocerebellar Ataxia (SCA)
- Syringomyelia
- Tarlov cysts
- Tourette's syndrome
- Traumatic brain injury and post-concussion syndrome

Indiana

Indiana's medical marijuana program is limited to CBD product only. These are the

health conditions that qualify for Indiana's program:

- Severe epilepsy resistant to other treatments
- Dravet syndrome
- Lennox-Gastaut syndrome

Iowa

Patients with one of the following conditions and the proper recommendations can use certain CBD extracts:

- AIDS/HIV
- Amyotrophic lateral sclerosis (ALS)
- Cancer
- Cancer-related chronic pain, nausea, or cachexia
- Crohn's disease
- Multiple sclerosis
- Parkinson's disease
- Intractable epilepsy
- Terminal illness
- Untreatable pain

Kentucky

Kentucky is another state with a narrow and fairly restrictive medical marijuana program. The state's qualifying conditions include:

- Intractable epilepsy

Louisiana

In Louisiana, patients with one of the following conditions may qualify to use non-smokable forms of cannabis:

- Cachexia
- Cancer
- Crohn's disease
- Epilepsy
- HIV/AIDS
- Muscular dystrophy,

- Multiple sclerosis
- Seizure disorders/spasticity

Maine

Voters in Maine approved the legalization of recreational cannabis in 2016. Currently, patients with one of these conditions can also qualify for medical marijuana:

- Alzheimer's disease
- Amyotrophic Lateral Sclerosis
- Cachexia or wasting syndrome
- Cancer
- Chronic pain
- Crohn's disease
- Epilepsy
- Glaucoma
- Hepatitis C
- HIV or AIDS
- Huntington's disease
- Inflammatory bowel disease
- Multiple Sclerosis
- Nausea
- Nail-patella syndrome
- Parkinson's disease
- Post-traumatic stress disorder (PTSD)

Maryland

In Maryland, patients may qualify for medical marijuana if they have one of these conditions:

- Cachexia
- Anorexia
- Chronic Pain
- Nausea
- Seizures
- Severe or persistent muscle spasms

Massachusetts

Massachusetts is scheduled to start selling recreational cannabis by July 2018. Until

then, you can get medical marijuana if you have one of the following conditions:

- Amyotrophic Lateral Sclerosis (ALS)
- Cancer
- Crohn's disease
- Glaucoma
- HIV or AIDS
- Hepatitis C
- Multiple Sclerosis
- Parkinson's disease
- Other conditions as determined in writing by a qualifying patient's physician.

Michigan

Michigan has a strong and active medical marijuana program. But big changes could be coming soon as the state revamps its licensing practices. Qualifying health conditions for medical marijuana in Michigan include:

- Alzheimer's disease
 - Amyotrophic Lateral Sclerosis
 - Cachexia or wasting syndrome
 - Cancer
 - Chronic pain
 - Crohn's disease
 - Glaucoma
 - HIV or AIDS
 - Hepatitis C
 - Nail-patella
 - Nausea
 - Post-traumatic stress disorder (PTSD)
 - Seizures
 - Severe and persistent muscle spasms
-

Minnesota

In Minnesota, medical marijuana patients are only allowed to use non-smoke able forms of cannabis. Here are the qualifying health conditions:

- Amyotrophic Lateral Sclerosis
- Cancer/cachexia
- Crohn's disease
- Glaucoma
- HIV/AIDS
- Intractable pain
- Post-traumatic stress disorder
- Seizures
- Severe and persistent muscle spasms
- Terminal illness
- Tourette's Syndrome

Mississippi

Mississippi is not known for permissive cannabis laws. Currently, only patients with the following conditions can use CBD oil:

- Intractable epilepsy

Missouri

Missouri also allows patients to use only CBD oil. Here are the qualifying health conditions:

- Intractable epilepsy

Montana

In 2016, voters in Montana approved a new medical marijuana program. Qualifying health conditions for medical marijuana in the state now include:

- Cachexia or wasting syndrome
- Cancer
- Chronic pain
- Crohn's disease
- Glaucoma
- HIV/AIDS

- Nausea
- Seizures
- Severe or persistent muscle spasms

Nevada

Now that Nevada has legalized recreational cannabis, it's pretty straightforward to get cannabis. But patients with one of these conditions can still qualify for the state's medical marijuana program:

- AIDS
- Cachexia
- Cancer
- Glaucoma
- Post-traumatic stress disorder (PTSD)
- Persistent muscle spasms or seizures
- Severe nausea or pain
- Other conditions are subject to approval.

New Hampshire

New Hampshire's medical marijuana laws were signed in 2013. Now, the qualifying health conditions for medical marijuana in the state include:

- ALS
- Alzheimer's disease
- Cachexia
- Cancer
- Chemotherapy-induced anorexia
- Chronic Pain (effective August 16, 2017)
- Chronic pancreatitis
- Crohn's disease
- Ehlers-Danlos syndrome (effective August 27, 2017)
- Elevated intraocular pressure
- Epilepsy
- Glaucoma

New Hampshire (cont)

- Hepatitis C (currently receiving antiviral treatment)
 - HIV/AIDS
 - Lupus
 - Moderate to severe vomiting
 - Multiple Sclerosis
 - Muscular Dystrophy
 - Nausea
 - Parkinson's disease
 - Persistent muscle spasms
 - Post-Traumatic Stress Disorder (effective August 27, 2017)
 - Seizures
 - Severe pain (that has not responded to previously prescribed medication)
 - Spinal cord injury or disease
 - Traumatic brain injury
 - Wasting syndrome
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New Jersey

Qualifying health conditions for medical marijuana in New Jersey include the following:

- Amyotrophic Lateral Sclerosis (ALS)
 - Cancer (includes associated chronic pain and/or severe nausea)
 - Crohn's disease
 - Glaucoma
 - HIV/AIDS (includes associated chronic pain and/or severe nausea)
 - Inflammatory bowel disease (IBD)
 - Multiple Sclerosis
 - Muscular Dystrophy
 - Post-Traumatic Stress Disorder
 - Seizure and/or spasticity disorders
 - Any terminal illness if a doctor has determined the patient will die within a year.
-

New Mexico

New Mexico allows patients with one of the following conditions to use cannabis and to grow as many as four mature cannabis plants at a time:

- Amyotrophic Lateral Sclerosis (Lou Gehrig's disease)
 - Anorexia/cachexia
 - Arthritis
 - Cancer
 - Cervical dystonia
 - Chronic pain
 - Crohn's disease
 - Epilepsy
 - Glaucoma
 - Hepatitis C
 - HIV/AIDS
 - Hospice patients
 - Huntington's disease
 - Intractable nausea/vomiting
 - Multiple sclerosis
 - Painful peripheral neuropathy
 - Parkinson's disease
 - Post-traumatic Stress Disorder
 - Spinal cord damage
-

New York

New York's medical marijuana program has come under fire for not being accessible enough. But as the state works to add more dispensaries and to expand the program, it could become a more helpful system for patients with one of these conditions:

- Amyotrophic Lateral Sclerosis (ALS)
- Cancer
- Chronic pain
- Epilepsy
- HIV/AIDS
- Huntington's Disease
- Inflammatory bowel disease

New York (cont)

- Parkinson's Disease
 - Multiple Sclerosis
 - Neuropathies
 - Spinal cord damage
-

North Carolina

North Carolina's laws let patients with certain conditions use CBD oil:

- Intractable epilepsy
-

North Dakota

North Dakota legalized medical marijuana during the elections of 2016. Qualifying conditions include:

- Agitation from Alzheimer's disease or related dementia
 - Amyotrophic lateral sclerosis (ALS)
 - Cachexia or Wasting syndrome
 - Cancer
 - Chronic or debilitating disease
 - Crohn's disease
 - Epilepsy
 - Fibromyalgia
 - Glaucoma
 - Hepatitis C
 - HIV/AIDS
 - Intractable nausea
 - Multiple sclerosis
 - Post-traumatic stress disorder (PTSD)
 - Seizures
 - Severe and persistent muscle spasms
 - Severe debilitating pain
 - Spinal stenosis
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Ohio

Ohio signed a medical marijuana bill in 2016, and it is expected to be up and running sometime in 2018. Qualifying health

conditions for medical marijuana in Ohio include:

- Acquired immune deficiency syndrome (AIDS)
 - Alzheimer's disease
 - Amyotrophic lateral sclerosis (Lou Gehrig's disease)
 - Cancer
 - Chronic traumatic encephalopathy
 - Crohn's disease
 - Epilepsy or other seizure disorders
 - Fibromyalgia
 - Glaucoma
 - Hepatitis C
 - Inflammatory bowel disease
 - Multiple Sclerosis
 - Pain that is either of the following nature: (i) Chronic and severe; or (ii) Intractable
 - Parkinson's disease
 - Positive status for HIV
 - Post-traumatic stress disorder
 - Sickle cell anemia
 - Spinal cord disease or injury
 - Tourette's syndrome
 - Traumatic brain injury
 - Ulcerative colitis
-

Oklahoma

Oklahoma's medical marijuana program remains very limited. Currently, only patients with the following conditions can use CBD oil:

- Pediatric epilepsy
- Cancer
- HIV/AIDS
- Epilepsy
- Inflammatory Bowel Disease
- Neuropathy
- Chronic Pain

Oklahoma (cont)

- Anorexia
- Cachexia or Wasting Syndrome
- Severe Nausea
- Severe or Persistent Muscle Spasms
- Crohn's Disease
- Spasticity
- Terminal Illness

Oregon

Oregon has already legalized recreational cannabis, but patients with the following conditions can also qualify for medical cannabis:

- Alzheimer's disease
- Cachexia
- Cancer
- Chronic pain
- Glaucoma
- HIV or AIDS
- Nausea
- Persistent muscle spasms
- Post-traumatic stress
- Seizures
- Other conditions are subject to approval.

Pennsylvania

Pennsylvania legalized medical cannabis during the spring of 2016. Currently, qualifying health conditions for medical marijuana in the state include:

- ALS (Lou Gehrig's disease)
- Autism
- Cancer
- Crohn's disease
- Epilepsy
- Glaucoma
- HIV/AIDS
- Huntington's disease

- Inflammatory bowel disease
- Intractable seizures
- Intractable spasticity
- Multiple Sclerosis
- Neuropathies
- Parkinson's disease
- Post-traumatic stress disorder
- Sickle cell anemia
- Severe chronic or intractable pain
- Terminal illness, defined as 12 months or fewer to live.

Rhode Island

Rhode Island's medical marijuana laws were signed in 2006. Now, qualifying health conditions for medical marijuana in Rhode Island include:

- Alzheimer's Disease
- Cachexia
- Cancer
- Chronic pain
- Crohn's disease
- Glaucoma
- Hepatitis C
- HIV/AIDS
- Nausea
- Persistent muscle spasms
- Post-traumatic stress disorder
- Seizures
- Other conditions are subject to approval.

South Carolina

South Carolina's CBD-only medical marijuana program offers limited forms of treatment for the following conditions:

- Dravet Syndrome
 - Lennox-Gastaut Syndrome
 - Refractory epilepsy
-

Tennessee

In Tennessee, you can use CBD oil if you have the following conditions:

- Intractable seizures
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Texas

Texas has taken a long time to develop a medical marijuana program. In September 2017, the state finally issued its first medical marijuana license. Currently, qualifying health conditions include:

- Intractable epilepsy
-

Utah

Medical Cannabis Approved

Recreational Use not Approved

Approved ailments for Medical Cannabis

- Amyotrophic Lateral Sclerosis
- Alzheimer's Disease
- Autism
- Cachexia
- Crohn's Disease or Ulcerative Colitis
- HIV/AIDS
- Epilepsy or a similar conditions that causes debilitating seizures.
- Multiple Sclerosis or persistent and debilitating muscle spasms
- Nausea (must be persistent)
- Pain lasting longer than 2 weeks that is not adequately managed despite treatment attempts.in the qualified medical provider's opinion, despite using conventional medications other than opioids or opiates or physical interventions.
- PTSD that is being treated or monitored by a licensed mental health therapist.

- Any terminal illness where life expectancy is less than 6 months.
- Any condition resulting in hospice care.
- Any rare condition that effects fewer than 200,000 persons in the United States as defined by Section 526 of the Federal Food, Drug, And Cosmetic Act and is not adequately managed despite treatment attempts.
- If the patient does not have a qualifying condition specifically named, they may petition the Compassionate Use Board for approval of their medical cannabis card.

Vermont

Vermont has a relatively open approach to cannabis. In fact, the state came close to legalizing recreational cannabis, but for now, qualifying health conditions for medical marijuana in Vermont include:

- Any patient receiving hospice care
 - Cachexia or wasting syndrome
 - Cancer
 - Crohn's disease
 - Glaucoma
 - HIV or AIDS
 - Multiple Sclerosis
 - Parkinson's disease
 - PTSD
 - Seizures
 - Severe or chronic pain
 - Severe nausea
-

Virginia

In Virginia, patients with these conditions can use a very precisely defined and tightly controlled form of CBD:

- Intractable epilepsy

Washington

In Washington, recreational and medical cannabis are legal. Here are the health conditions that qualify for medical cannabis:

- Cachexia
- Cancer
- Crohn's disease
- Glaucoma
- Hepatitis C
- HIV or AIDS
- Intractable pain
- Persistent muscle spasms, and/or spasticity
- Nausea
- PTSD
- Seizures
- Traumatic brain injury
- Any terminal or debilitating condition.

West Virginia

West Virginia's medical marijuana laws are not yet operation. They're scheduled to go into effect in 2018. For now, Qualifying health conditions for medical marijuana in West Virginia include:

- Amyotrophic lateral sclerosis (ALS)
- Cancer
- Crohn's disease
- HIV/AIDS
- Epilepsy

- Huntington's disease
- Intractable seizures
- Multiple sclerosis
- Neuropathies (chronic nerve pain)
- Parkinson's disease
- Post-traumatic stress disorder
- Severe chronic or intractable pain
- Spinal cord damage
- Sickle cell anemia
- Terminal illness

Wisconsin

Wisconsin has a CBD-only medical marijuana program. Here's what qualifies:

- Any medical condition for which a patient receives the proper doctor recommendations.

Wyoming

Wyoming's CBD-only medical laws apply to patients with:

- Intractable epilepsy

Washington, D.C.

Washington, D.C. has surprisingly liberal cannabis laws. Qualifying health conditions for medical marijuana in Washington, D.C. include:

- Any condition that a doctor deems debilitating and for which the doctor gives proper recommendations.

APPENDIX 2

THE HEALTH EFFECTS OF CANNABIS AND CANNABINOIDS

COMMITTEE'S CONCLUSIONS **January 2017**

In the report *The Health Effects of Cannabis and Cannabinoids: The Current State of Evidence and Recommendations for Research*, an expert, ad hoc committee of the National Academies of Sciences, Engineering, and Medicine presents nearly 100 conclusions related to the health effects of cannabis and cannabinoid use.

The committee developed standard language to categorize the weight of the evidence regarding whether cannabis or cannabinoids used for *therapeutic* purposes are an effective or ineffective treatment for certain prioritized health conditions, or whether cannabis or cannabinoids used primarily for *recreational* purposes are statistically associated with certain prioritized health conditions. The box on the next page describes these categories and the general parameters for the types of evidence supporting each category.

The numbers in parentheses after each conclusion correspond to chapter conclusion numbers. Each header below links to the corresponding chapter in the report, providing much more detail regarding the committee's findings and conclusions. To read the full report, please visit nationalacademies.org/CannabisHealthEffects.

CONCLUSIONS FOR: THERAPEUTIC EFFECTS

There is conclusive or substantial evidence that cannabis or cannabinoids are effective: • For the treatment for chronic pain in adults (cannabis) (4-1) • Antiemetics in the treatment of chemotherapy-induced nausea and vomiting (oral cannabinoids) (4-3) • For improving patient-reported multiple sclerosis spasticity symptoms (oral cannabinoids) (4-7a)

There is moderate evidence that cannabis or cannabinoids are effective for: • Improving short-term sleep outcomes in individuals with sleep disturbance associated with obstructive sleep apnea syndrome, bromyalgia, chronic pain, and multiple sclerosis (cannabinoids, primarily nabiximols) (4-19)

There is limited evidence that cannabis or cannabinoids are effective for:

- Increasing appetite and decreasing weight loss associated with HIV/AIDS (cannabis and oral cannabinoids) (4-4a)

- Improving clinician-measured multiple sclerosis spasticity symptoms (oral cannabinoids) (4-7a)
- Improving symptoms of Tourette syndrome (THC capsules) (4-8)
- Improving anxiety symptoms, as assessed by a public speaking test, in individuals with social anxiety disorders (cannabidiol) (4-17)
- Improving symptoms of posttraumatic stress disorder (nabilone; one single, small fair-quality trial) (4-20) **There is limited evidence of a statistical association between cannabinoids and:**
 - Better outcomes (i.e., mortality, disability) after a traumatic brain injury or intracranial hemorrhage (4-15) **There is limited evidence that cannabis or cannabinoids are ineffective for:**
- Improving symptoms associated with dementia (cannabinoids) (4-13)
- Improving intraocular pressure associated with glaucoma (cannabinoids) (4-14)
- Reducing depressive symptoms in individuals with chronic pain or multiple sclerosis (nabiximols, dronabinol, and nabilone) (4-18)

DEFINITIONS OF WEIGHTS OF EVIDENCE

The committee used the following standardized language to categorize the weight of the evidence regarding cannabis or cannabinoid use for the prioritized health conditions:

CONCLUSIVE evidence

For therapeutic effects: There is strong evidence from randomized controlled trials to support the conclusion that cannabis or cannabinoids are an effective or ineffective treatment for the health endpoint of interest.

For other health effects: There is strong evidence from randomized controlled trials to support or refute a statistical association between cannabis or cannabinoid use and the health endpoint of interest.

For this level of evidence, there are many supportive findings from good-quality studies with no credible opposing findings. A firm conclusion can be made, and the limitations to the evidence, including chance, bias, and confounding factors, can be ruled out with reasonable confidence.

SUBSTANTIAL evidence:

For therapeutic effects: There is strong evidence to support the conclusion that cannabis or cannabinoids are an effective or ineffective treatment for the health endpoint of interest.

For other health effects: There is strong evidence to support or refute a statistical association between cannabis or cannabinoid use and the health endpoint of interest.

For this level of evidence, there are several supportive findings from good-quality studies with very few or no credible opposing findings. A firm conclusion can be made, but minor limitations, including chance, bias, and confounding factors, cannot be ruled out with reasonable confidence.

MODERATE evidence:

For therapeutic effects: There is some evidence to support the conclusion that cannabis or cannabinoids are an effective or ineffective treatment for the health endpoint of interest.

For other health effects: There is some evidence to support or refute a statistical association between cannabis or cannabinoid use and the health endpoint of interest.

For this level of evidence, there are several findings from good- to fair-quality studies with very few or no credible opposing findings. A general conclusion can be made, but limitations, including chance, bias, and confounding factors, cannot be ruled out with reasonable confidence.

LIMITED evidence:

For therapeutic effects: There is weak evidence to support the conclusion that cannabis or cannabinoids are an effective or ineffective treatment for the health endpoint of interest.

For other health effects: There is weak evidence to support or refute a statistical association between cannabis or cannabinoid use and the health endpoint of interest.

For this level of evidence, there are supportive findings from fair-quality studies or mixed findings with most favoring one conclusion. A conclusion can be made, but there is significant uncertainty due to chance, bias, and confounding factors.

NO or INSUFFICIENT evidence to support the association:

For therapeutic effects: There is no or insufficient evidence to support the conclusion that cannabis or cannabinoids are an effective or ineffective treatment for the health

endpoint of interest.

For other health effects: There is no or insufficient evidence to support or refute a statistical association between cannabis or cannabinoid use and the health endpoint of interest.

For this level of evidence, there are mixed findings, a single poor study, or health endpoint has not been studied at all. No conclusion can be made because of substantial uncertainty due to chance, bias, and confounding factors.

There is no or insufficient evidence to support or refute the conclusion that cannabis or cannabinoids are an effective treatment for:• Cancers, including glioma (cannabinoids) (4-2)• Cancer-associated anorexia cachexia syndrome and anorexia nervosa (cannabinoids) (4-4b)

• Symptoms of irritable bowel syndrome (dronabinol) (4-5)• Epilepsy (cannabinoids) (4-6)• Spasticity in patients with paralysis due to spinal cord injury (cannabinoids) (4-7b)• Symptoms associated with amyotrophic lateral sclerosis (cannabinoids) (4-9)• Chorea and certain neuropsychiatric symptoms associated with Huntington’s disease (oral cannabinoids) (4-10)• Motor system symptoms associated with Parkinson’s disease or the levodopa-induced dyskinesia (cannabinoids) (4-11) • Dystonia (nabilone and dronabinol) (4-12)• Achieving abstinence in the use of addictive substances (cannabinoids) (4-16)• Mental health outcomes in individuals with schizophrenia or schizophreniform psychosis (cannabidiol) (4-21)

CONCLUSIONS FOR: CANCER

There is moderate evidence of *no* statistical association between cannabis use and:

• Incidence of lung cancer (cannabis smoking) (5-1)• Incidence of head and neck cancers (5-2)

There is limited evidence of a statistical association between cannabis smoking and:

• Non-seminoma-type testicular germ cell tumors (current, frequent, or chronic cannabis smoking) (5-3)

There is no or insufficient evidence to support or refute a statistical association between cannabis use and:

- Incidence of esophageal cancer (cannabis smoking) (5-4)
- Incidence of prostate cancer, cervical cancer, malignant gliomas, non-Hodgkin lymphoma, penile cancer, anal cancer, Kaposi’s sarcoma, or bladder cancer (5-5)
- Subsequent risk of developing acute myeloid leukemia/acute non-lymphoblastic

leukemia, acute lymphoblastic leukemia, rhabdomyosarcoma, astrocytoma, or neuroblastoma in offspring (parental cannabis use) (5-

- **CONCLUSIONS FOR: CARDIOMETABOLIC RISK**

- **There is limited evidence of a statistical association between cannabis use and:** • The triggering of acute myocardial infarction (cannabis smoking) (6-1a) • Ischemic stroke or subarachnoid hemorrhage (6-2) • Decreased risk of metabolic syndrome and diabetes (6-3a) • Increased risk of prediabetes (6-3b)
- **There is no evidence to support or refute a statistical association between *chronic effects* of cannabis use and:** • The increased risk of acute myocardial infarction (6-1b)

- **CONCLUSIONS FOR: RESPIRATORY DISEASE**

- **There is substantial evidence of a statistical association between cannabis smoking and:** • Worse respiratory symptoms and more frequent chronic bronchitis episodes (long-term cannabis smoking) (7-3a) • There is moderate evidence of a statistical association between cannabis smoking and: • Improved airway dynamics with acute use, but not with chronic use (7-1a) • Higher forced vital capacity (FVC) (7-1b)
- **There is moderate evidence of a statistical association between *the cessation of cannabis smoking* and:** • Improvements in respiratory symptoms (7-3b)
- **There is limited evidence of a statistical association between cannabis smoking and:** • An increased risk of developing chronic obstructive pulmonary disease (COPD) when controlled for tobacco use (occasional cannabis smoking) (7-2a)

There is no or insufficient evidence to support or refute a statistical association between cannabis smoking and: • Hospital admissions for COPD (7-2b) • Asthma development or asthma exacerbation (7-4)

CONCLUSIONS FOR: IMMUNITY

There is limited evidence of a statistical association between cannabis smoking and:

- A decrease in the production of several inflammatory cytokines in healthy individuals (8-1a)

There is limited evidence of *no* statistical association between cannabis use and:
The progression of liver fibrosis or hepatic disease in individuals with viral Hepatitis C (HCV) (daily cannabis use) (8-3)

There is no or insufficient evidence to support or refute a statistical association between cannabis use and: • Other adverse immune cell responses in healthy individuals (cannabis smoking) (8-1b) • Adverse effects on immune status in individuals with HIV (cannabis or dronabinol use) (8-2) • Increased incidence of oral human papilloma virus (HPV) (regular cannabis use) (8-4)

CONCLUSIONS FOR: INJURY AND DEATH

There is substantial evidence of a statistical association between cannabis use and:

- Increased risk of motor vehicle crashes (9-3)

There is moderate evidence of a statistical association between cannabis use and:
Increased risk of overdose injuries, including respiratory distress, among pediatric populations in U.S. states where cannabis is legal (9-4b)

There is no or insufficient evidence to support or refute a statistical association between cannabis use and: • All-cause mortality (self-reported cannabis use) (9-1) • Occupational accidents or injuries (general, non-medical cannabis use) (9-2) • Death due to cannabis overdose (9-4a)

CONCLUSIONS FOR: PRENATAL, PERINATAL, AND NEONATAL EXPOSURE

There is substantial evidence of a statistical association between maternal cannabis smoking and:

- Lower birth weight of the offspring (10-2)

There is limited evidence of a statistical association between maternal cannabis smoking and: • Pregnancy complications for the mother (10-1) • Admission of the infant to the neonatal intensive care unit (NICU) (10-3)

There is insufficient evidence to support or refute a statistical association between maternal cannabis smoking and: • Later outcomes in the offspring (e.g., sudden infant death syndrome, cognition/academic achievement, and later substance use) (10-4)

CONCLUSIONS FOR: PSYCHOSOCIAL

There is moderate evidence of a statistical association between cannabis use and:

- The impairment in the cognitive domains of learning, memory, and attention (acute cannabis use) (11-1a)

There is limited evidence of a statistical association between cannabis use and:

• Impaired academic achievement and education outcomes (11-2) • Increased rates of unemployment and/or low income (11-3) • Impaired social functioning or engagement in developmentally appropriate social roles (11-4)

There is limited evidence of a statistical association between *sustained abstinence from cannabis use* and: • Impairments in the cognitive domains of learning, memory, and attention (11-1b)

CONCLUSIONS FOR: MENTAL HEALTH

There is substantial evidence of a statistical association between cannabis use and:

- The development of schizophrenia or other psychoses, with the highest risk among the most frequent users (12-1)

There is moderate evidence of a statistical association between cannabis use and:

Better cognitive performance among individuals with psychotic disorders and a history of cannabis use (12-2a) • Increased symptoms of mania and hypomania in individuals diagnosed with bipolar disorders (regular cannabis use) (12-4) • A small increased risk for the development of depressive disorders (12-5) • Increased incidence of suicidal ideation and suicide attempts with a higher incidence among heavier users (12-7a) • Increased incidence of suicide completion (12-7b) • Increased incidence of social anxiety disorder (regular cannabis use) (12-8b)

There is moderate evidence of *no* statistical association between cannabis use and: • Worsening of negative symptoms of schizophrenia (e.g., blunted affect) among individuals with psychotic disorders (12-2c)

There is limited evidence of a statistical association between cannabis use and:

An increase in positive symptoms of schizophrenia (e.g., hallucinations) among individuals with psychotic disorders (12-2b) • The likelihood of developing bipolar disorder, particularly among regular or daily users (12-3) • The development of any type of anxiety disorder, except social anxiety disorder (12-8a) • Increased symptoms of anxiety (near daily cannabis use) (12-9) • Increased severity of posttraumatic stress

disorder symptoms among individuals with posttraumatic stress disorder (12-11)

There is no evidence to support or refute a statistical association between cannabis use and: • Changes in the course or symptoms of depressive disorders (12-6) • The development of posttraumatic stress disorder (12-10)

CONCLUSIONS FOR: PROBLEM CANNABIS USE

There is substantial evidence that:

- Stimulant treatment of attention deficit hyperactivity disorder (ADHD) during adolescence is *not* a risk factor for the development of problem cannabis use (13-2e)
- Being male and smoking cigarettes are risk factors for the progression of cannabis use to problem cannabis use (13-2i)
- Initiating cannabis use at an earlier age is a risk factor for the development of problem cannabis use (13-2j)
- **There is substantial evidence of a statistical association between:**
 - Increases in cannabis use frequency and the progression to developing problem cannabis use (13-1)
 - Being male and the severity of problem cannabis use, but the recurrence of problem cannabis use does not differ between males and females (13-3b)
- **There is moderate evidence that:**
 - Anxiety, personality disorders, and bipolar disorders are *not* risk factors for the development of problem cannabis use (13-2b)
 - Major depressive disorder is a risk factor for the development of problem cannabis use (13-2c)
 - Adolescent ADHD is *not* a risk factor for the development of problem cannabis use (13-2d)
 - Being male is a risk factor for the development of problem cannabis use (13-2f)
 - Exposure to the combined use of abused drugs is a risk factor for the development of problem cannabis use (13-2g)

- Neither alcohol nor nicotine dependence alone are risk factors for the progression from cannabis use to problem cannabis use (13-2h)
- During adolescence the frequency of cannabis use, oppositional behaviors, a younger age of first alcohol use, nicotine use, parental substance use, poor school performance, antisocial behaviors, and childhood sexual abuse are risk factors for the development of problem cannabis use (13-2k) **There is moderate evidence of a statistical association between:**
 - A persistence of problem cannabis use and a history of psychiatric treatment (13-3a)
 - Problem cannabis use and increased severity of posttraumatic stress disorder symptoms (13-3c) **There is limited evidence that:**
 - Childhood anxiety and childhood depression are risk factors for the development of problem cannabis use (13-2a)

CONCLUSIONS FOR: ABUSE OF OTHER SUBSTANCES

There is moderate evidence of a statistical association between cannabis use and: • The development of substance dependence and/or substance abuse disorder for substances including alcohol, tobacco,

and other illicit drugs (14-3)

There is limited evidence of a statistical association between cannabis use and: • The initiation of tobacco use (14-1) • Changes in the rates and use patterns of other licit and illicit substances (14-2)

CONCLUSIONS FOR: CHALLENGES AND BARRIERS IN CONDUCTING CANNABIS AND CANNABINOID RESEARCH

There are several challenges and barriers in conducting cannabis and cannabinoid research, including:

- There are specific regulatory barriers, including the classification of cannabis as a Schedule I substance, that impede the advancement of cannabis and cannabinoid research (15-1)
- It is often difficult for researchers to gain access to the quantity, quality, and type of cannabis product necessary to address specific research questions on the health effects of cannabis use (15-2)
- A diverse network of funding is needed to support cannabis and cannabinoid research that explores the beneficial and harmful effects of cannabis use (15-3)
- To develop conclusive evidence for the effects of cannabis use for short- and long-

term health outcomes, improvements and standardization in research methodology (including those used in controlled trials and observational studies) are needed (15-4)

Appendix 3

1. Anderson DM, Hansen B, Rees DI, Sabia JJ. Association of Marijuana Laws With Teen Marijuana Use: New Estimates From the Youth Risk Behavior Surveys. *JAMA Pediatr.* 2019;173(9):879–881. doi:10.1001/jamapediatrics.2019.1720
2. Erin J. Farley, Ph.D., Stan Orchowsky, Ph.D. Measuring the Criminal Justice System Impacts of Marijuana Legalization and Decriminalization Using State Data September 2019 BJS 2012-BJ-CX-K032
3. Wu, Boateng, et.al. The Spillover Effect of Recreational Marijuana Legalization on Crime: Evidence From Neighboring States of Colorado and Washington State. *Journal of Drug Issues*, vol. 50, 4: pp. 392-409. ,
4. Hawley et al. The impact of legalization of access to recreational Cannabis on Canadian medical users with Cancer *BMC Health Services Research* (2020) 20:977 <https://doi.org/10.1186/s12913-020-05756-8>