

Medical Marijuana: A Critical Look at Medicine, Politics, Profits, and Youth Impact

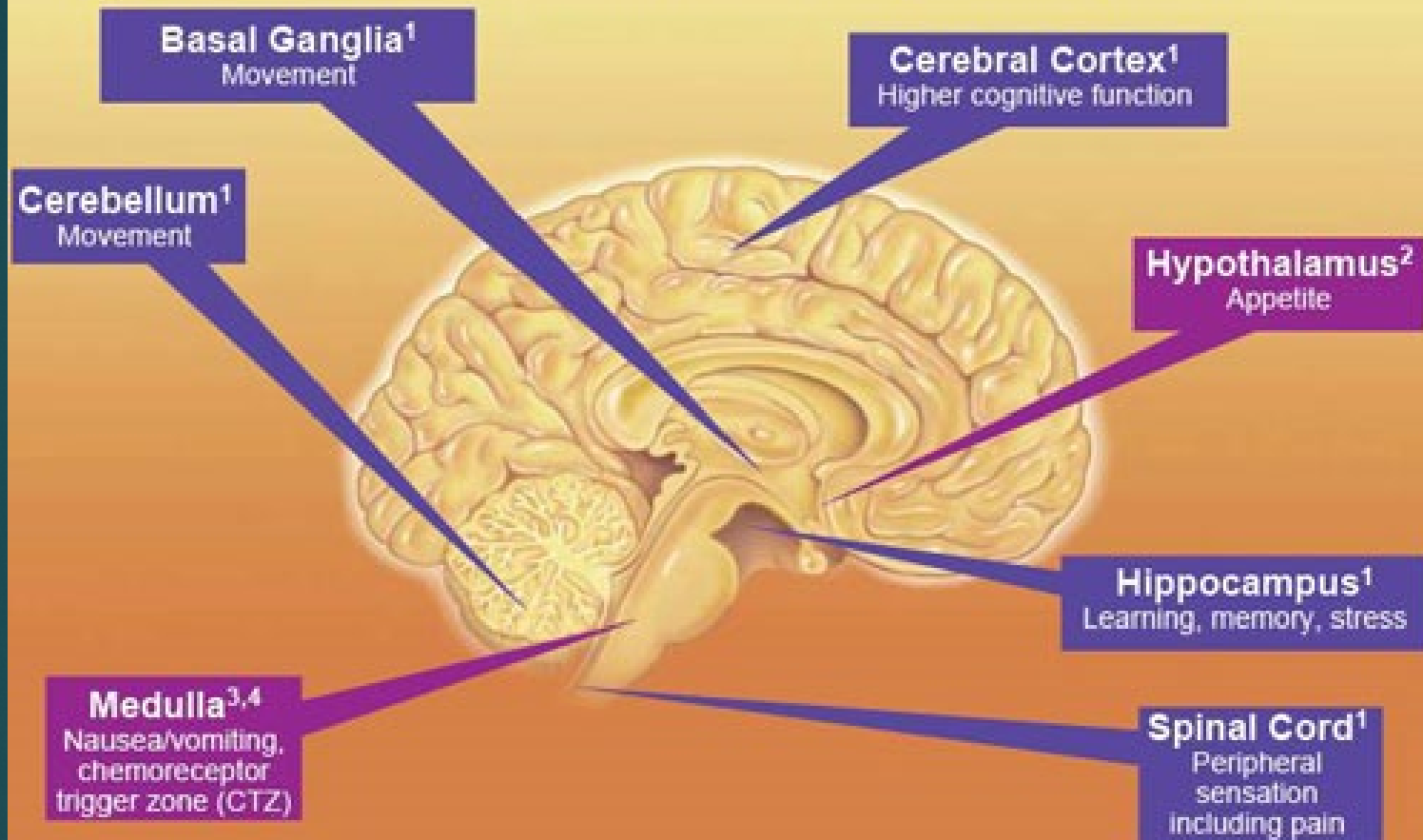
PANUPAN SRIPAN



What is marijuana?

- ▶ Plant with 500 chemical compounds, and 100 cannabinoids
- ▶ THC & CBD
- ▶ THC binds to CB1 receptors in the brain

Concentrations of CB₁ receptors



1. Joy JE, et al, eds. *Marijuana and Medicine: Assessing the Science Base*. Washington, DC: National Academy Press; 1999:33-81. 2. Marin BR, et al. *J Support Oncol*. 2004;2(4):305-318. 3. Grotenhemen F. *Curr Drug Targets CNS Neurol Disord*. 2005;4(5):507-530. 4. Navari RM, et al. *Expert Opin Emerg Drugs*. 2006;11(1):137-151.



What is marijuana?

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- ▶ Most-used substance behind alcohol & tobacco
- ▶ Number of routes of administration



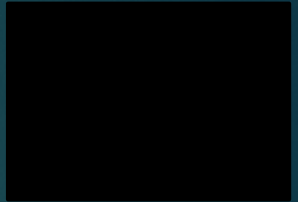




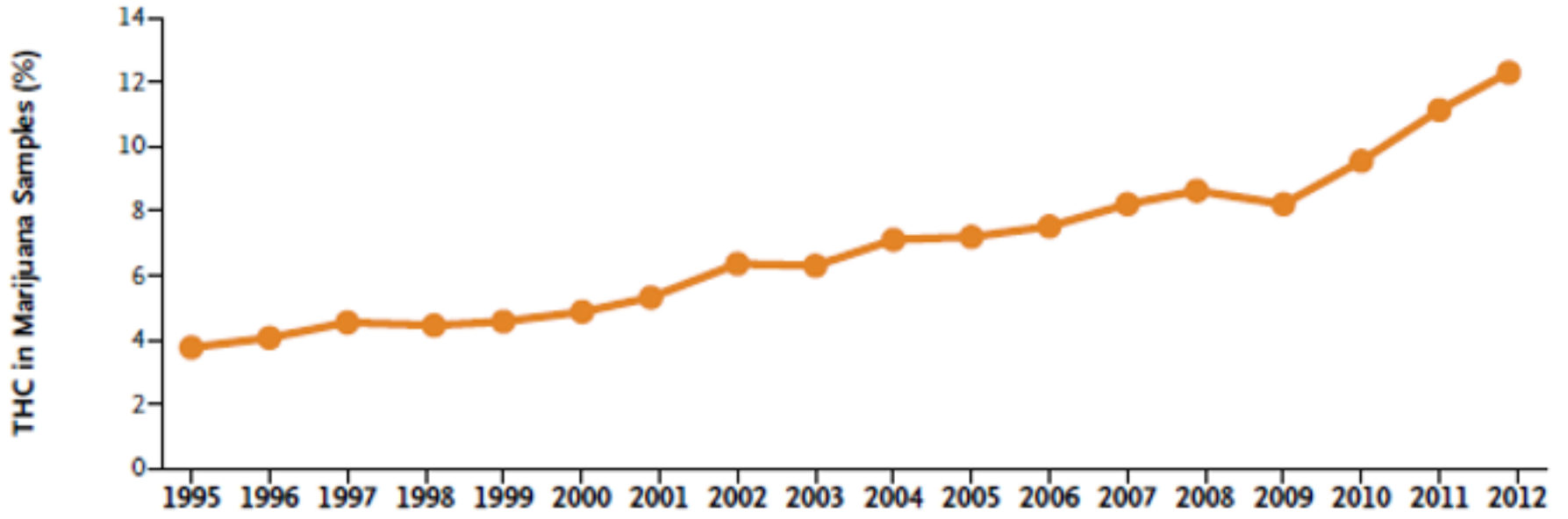
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7

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- ▶ Number of routes of administration
- ▶ High variability of concentration



A Potency of THC



(Volkow et al., 2014)



What is marijuana?

9

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- ▶ Number of routes of administration
- ▶ High variability of concentration
- ▶ Addictive substance

Review of the Validity and Significance of Cannabis Withdrawal Syndrome

Alan J. Budney, Ph.D.

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Brent A. Moore, Ph.D.

Ryan Vandrey, M.A.

The authors review the literature examining the validity and significance of cannabis withdrawal syndrome. Findings from animal laboratory research are briefly reviewed, and human laboratory and clinical studies are surveyed in more detail. Converging evidence from basic laboratory and clinical studies indicates that a withdrawal syndrome reliably follows discontinuation of chronic heavy use of cannabis or tetrahydrocannabinol. Common symptoms are primarily emotional and behavioral, although appetite change, weight loss, and physical discomfort are also frequently reported. The onset and time course of these symptoms appear similar to those of other substance withdrawal syndromes. The magnitude and severity of these symptoms appear substantial, and these findings suggest that the syndrome has clinical importance. Diagnostic criteria for cannabis withdrawal syndrome are proposed.

(*Am J Psychiatry* 2004; 161:1967-1977)

DIAGNOSTIC AND STATISTICAL MANUAL OF MENTAL DISORDERS

FIFTH EDITION

DSM-5™

AMERICAN PSYCHIATRIC ASSOCIATION

The NEW ENGLAND JOURNAL of MEDICINE

REVIEW ARTICLE

Dan L. Longo, M.D., *Editor*

Adverse Health Effects of Marijuana Use

Nora D. Volkow, M.D., Ruben D. Baler, Ph.D., Wilson M. Compton, M.D., and Susan R.B. Weiss, Ph.D.

Effects of long-term or heavy use

Addiction (in about 9% of users overall, 17% of those who begin use in adolescence, and 25 to 50% of those who are daily users)*

Cannabis-Related Disorders

- Cannabis Use Disorder
- Cannabis Intoxication
- Cannabis Withdrawal
- Other Cannabis-Induced Disorders
- Unspecified Cannabis-Related Disorder

Cannabis Use Disorder

Diagnostic Criteria

4. A problematic pattern of cannabis use leading to clinically significant impairment or distress, as manifested by at least two of the following, occurring within a 12-month period:
 1. Cannabis is often taken in larger amounts or over a longer period than was intended.
 2. There is a persistent desire or unsuccessful efforts to cut down or control cannabis use.
 3. A great deal of time is spent in activities necessary to obtain cannabis, use cannabis, or recover from its effects.
 4. Craving, or a strong desire or urge to use cannabis.
 5. Recurrent cannabis use resulting in a failure to fulfill major role obligations at work, school, or home.
 6. Continued cannabis use despite having persistent or recurrent social or interpersonal problems caused or exacerbated by the effects of cannabis.
 7. Important social, occupational, or recreational activities are given up or reduced because of cannabis use.
 8. Recurrent cannabis use in situations in which it is physically hazardous.
 9. Cannabis use is continued despite knowledge of having a persistent or recurrent physical or psychological problem that is likely to have been caused or exacerbated by cannabis.
10. Tolerance, as defined by either of the following:
 - a. A need for markedly increased amounts of cannabis to achieve intoxication or desired effect.
 - b. Markedly diminished effect with continued use of the same amount of cannabis.
11. Withdrawal, as manifested by either of the following:
 - a. The characteristic withdrawal syndrome for cannabis (refer to Criteria A and B of the criteria set for cannabis withdrawal, pp. 517-518).



What is marijuana?

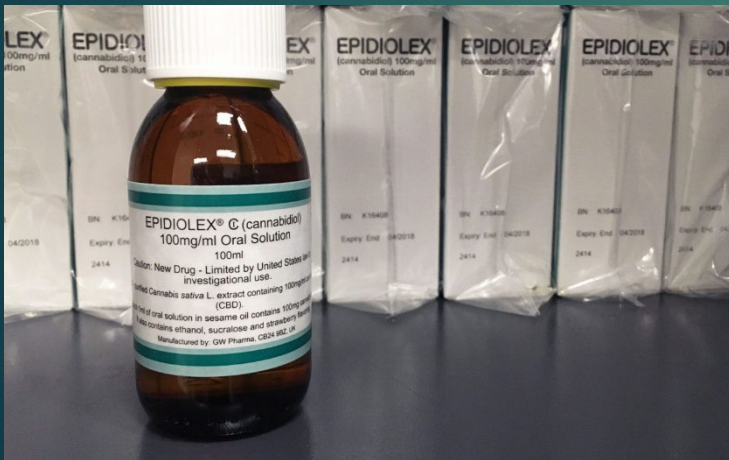
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- ▶ THC & CBD
- ▶ THC binds to CB1 receptors
- ▶ Most-used substance behind alcohol & tobacco
- ▶ Number of routes of administration
- ▶ High variability of concentration
- ▶ Addictive substance
 - ▶ Approximately 30% of active users have a SUD
 - ▶ 1:10 adults, 1:6 adolescents
- ▶ Well-studied detrimental impact on behavioral health and functioning

Is this medicine?

12

- ▶ In Illinois since 2013
- ▶ Not approved by the FDA, nor prescribed/dispensed like medicine
 - ▶ **Medicine:** Marinol, Sativex, and Epidiolex



Is this medicine?

14

- ▶ In Illinois since 2013
- ▶ Not approved by the FDA, nor prescribed/dispensed like medicine
 - ▶ **Medicine:** Marinol, Sativex, and Epidiolex
 - ▶ **Not medicine:** Buying whatever you like from a dispensary, using it however you want
 - ▶ Also consider: physicians are not pushing for this

Therapeutic Uses for

15

▶ **Marijuana** What does quality research show it is good for?

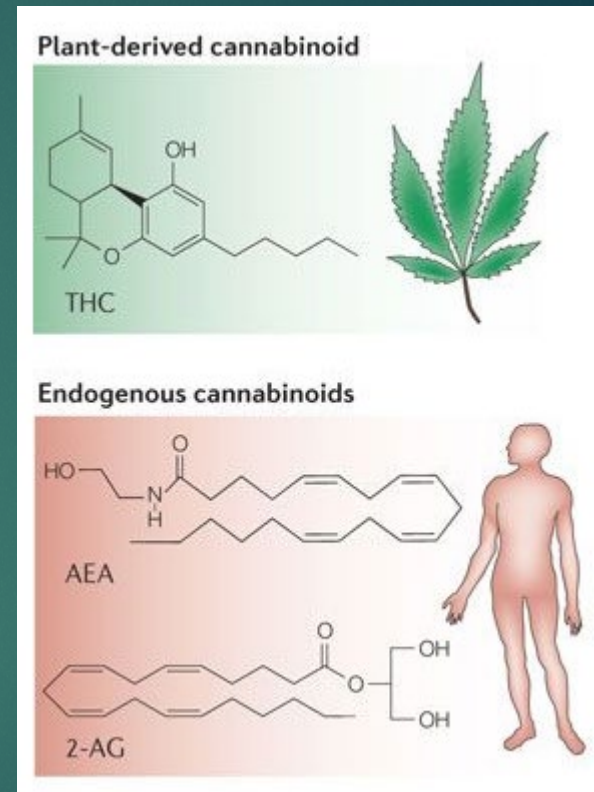
- ▶ Appetite stimulation
- ▶ Nausea suppression
- ▶ MS spasticity (cannabinoids only)
- ▶ Short-term sleep outcomes (cannabinoids only)
- ▶ Pain?
- ▶ Good reference: [National Academy of Sciences](#)
- ▶ In Illinois, it is approved (by the legislature) for ~~40~~ **51** conditions...starting at age 18

- ▶ Agitation of Alzheimer's disease
- ▶ HIV/AIDS
- ▶ Amyotrophic lateral sclerosis (ALS)
- ▶ Arnold-Chiari malformation
- ▶ Cancer
- ▶ Causalgia
- ▶ Chronic inflammatory demyelinating polyneuropathy
- ▶ Crohn's disease
- ▶ CRPS (complex regional pain syndrome Type II)
- ▶ Dystonia
- ▶ Fibrous Dysplasia
- ▶ Glaucoma
- ▶ Hepatitis C
- ▶ Hydrocephalus
- ▶ Hydromyelia
- ▶ Interstitial cystitis
- ▶ Lupus
- ▶ Multiple Sclerosis
- ▶ Muscular Dystrophy
- ▶ Myasthenia Gravis
- Myoclonus
- Nail-patella syndrome
- Neurofibromatosis
- Parkinson's disease
- Post-Concussion Syndrome
- Post-Traumatic Stress Disorder (PTSD)
- Reflex sympathetic dystrophy
- Residual limb pain
- Rheumatoid arthritis
- Seizures (including those characteristic of Epilepsy)
- Severe fibromyalgia
- Sjogren's syndrome
- Spinal cord disease (including but not limited to arachnoiditis)
- Spinal cord injury is damage to the nervous tissue of the spinal cord with objective neurological indication of intractable spasticity
- Spinocerebellar ataxia
- Syringomyelia
- Tarlov cysts
- Tourette syndrome
- Traumatic brain injury
- Cachexia/wasting syndrome

Endogenous Cannabinoids vs. Exogenous Manipulation

17

- ▶ Theory
 - ▶ Endocannabinoid system impacts many different diseases
 - ▶ Manipulate the same receptors, get the desired effect
- ▶ Reality
 - ▶ Hit & Miss



(Nature, 2012)

Medical Marijuana

18

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)



AMERICAN
GLAUCOMA
SOCIETY

Summary: Although marijuana can lower the intraocular pressure (IOP), its side effects and short duration of action, coupled with a lack of evidence that it use alters the course of glaucoma, preclude recommending this drug in any form for the treatment of glaucoma at the present time.

Narrative review of the safety and efficacy of marijuana for the treatment of commonly state-approved medical and psychiatric disorders

Katherine A Belendiuk¹, Lisa L Baldini² and Marcel O Bonn-Miller^{3,4,5*}

Abstract

The present investigation aimed to provide an objective narrative review of the existing literature pertaining to the benefits and harms of marijuana use for the treatment of the most common medical and psychological conditions for which it has been allowed at the state level. Common medical conditions for which marijuana is allowed (i.e., those conditions shared by at least 80 percent of medical marijuana states) were identified as: Alzheimer's disease, amyotrophic lateral sclerosis, cachexia/wasting syndrome, cancer, Crohn's disease, epilepsy and seizures, glaucoma, hepatitis C virus, human immunodeficiency virus/acquired immunodeficiency syndrome, multiple sclerosis and muscle spasticity, severe and chronic pain, and severe nausea. Post-traumatic stress disorder was also included in the review, as it is the sole psychological disorder for which medical marijuana has been allowed. Studies for this narrative review were included based on a literature search in PsycINFO, MEDLINE, and Google Scholar. Findings indicate that, for the majority of these conditions, there is insufficient evidence to support the recommendation of medical marijuana at this time. A significant amount of rigorous research is needed to definitively ascertain the potential implications of marijuana for these conditions. It is important for such work to not only examine the effects of smoked marijuana preparations, but also to compare its safety, tolerability, and efficacy in relation to existing pharmacological treatments.

Keywords: Cannabis, Medical marijuana, Marijuana, Medicine, Treatment, Alzheimer's disease, ALS, Cachexia, Cancer, Crohn's disease, Epilepsy, Seizures, Glaucoma, Hepatitis C virus, HCV, HIV, AIDS, Multiple sclerosis, MS, Pain, Nausea, Vomiting, Post-traumatic stress disorder, PTSD