Drug Endangered Children and Marijuana

Synthetic Cannabinoids: Is it Really Marijuana?

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Commissioner, OBN
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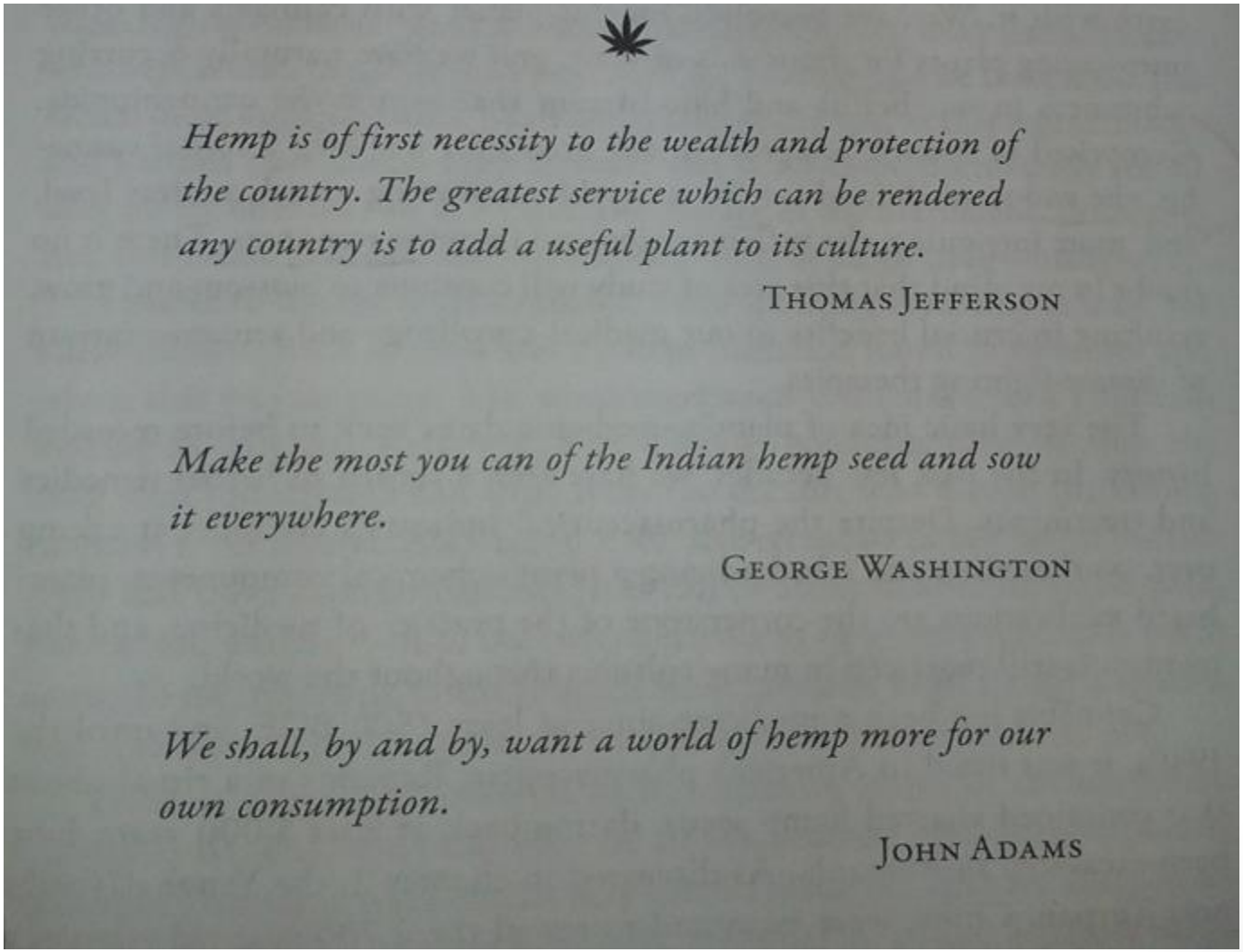
OKLAHOMA DRUG ENDANGERED CHILDREN

DRUG ENDANGERED CHILD - DEFINED

- 22. “Drug-endangered child” means a child who is at risk of suffering physical, psychological or sexual harm as a result of the use, possession, distribution, manufacture or cultivation of controlled substances, or the attempt of any of these acts, by a person responsible for the health, safety or welfare of the child, as defined in paragraph 51 of this section. This term includes circumstances wherein the substance abuse of the person responsible for the health, safety or welfare of the child interferes with that person’s ability to parent and provide a safe and nurturing environment for the child. The term also includes newborns who test positive for a controlled dangerous substance, with the exception of those substances administered under the care of a physician;

MARIJUANA



Hemp is of first necessity to the wealth and protection of the country. The greatest service which can be rendered any country is to add a useful plant to its culture.

THOMAS JEFFERSON

Make the most you can of the Indian hemp seed and sow it everywhere.

GEORGE WASHINGTON

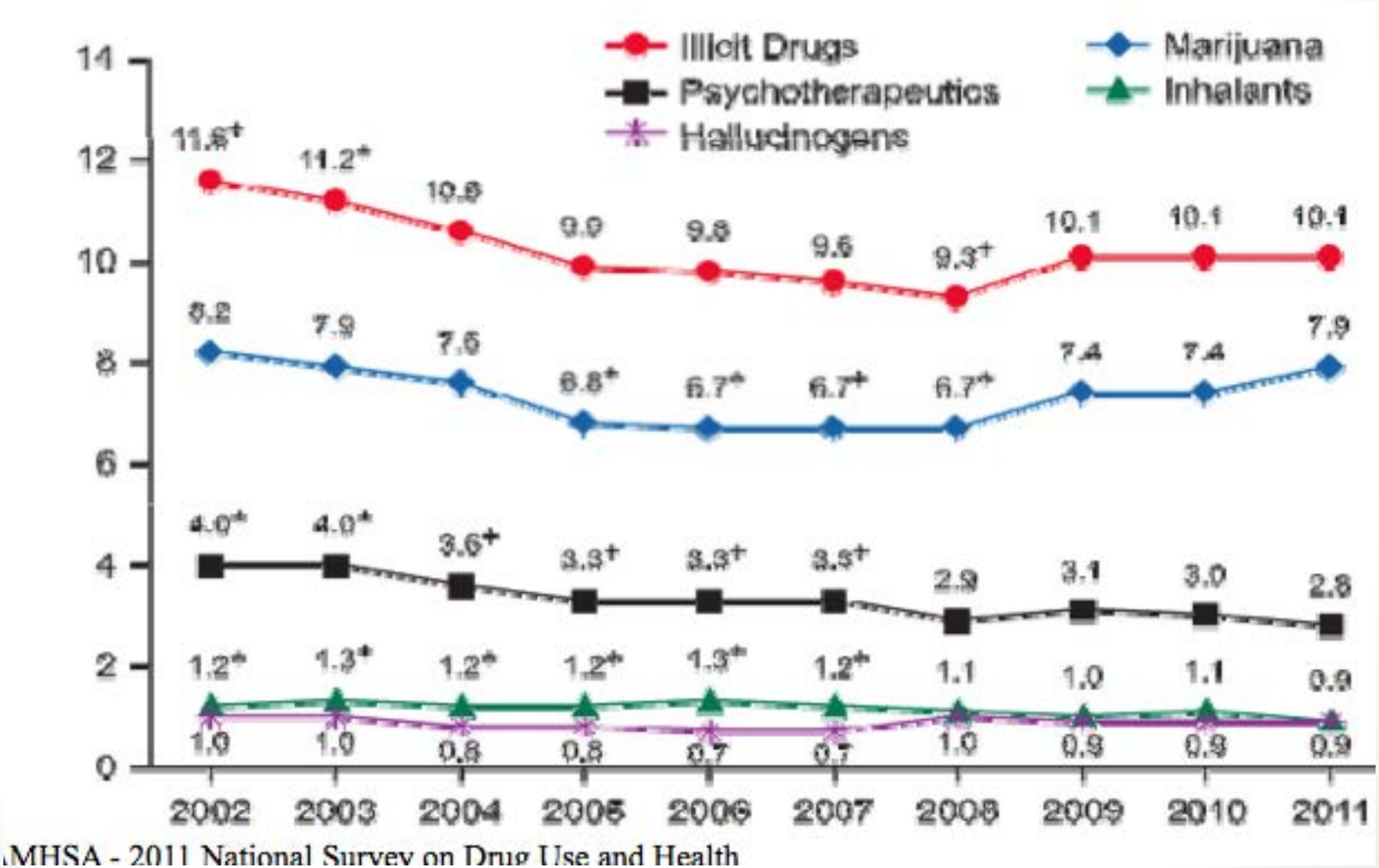
We shall, by and by, want a world of hemp more for our own consumption.

JOHN ADAMS

MARIJUANA STATISTICS

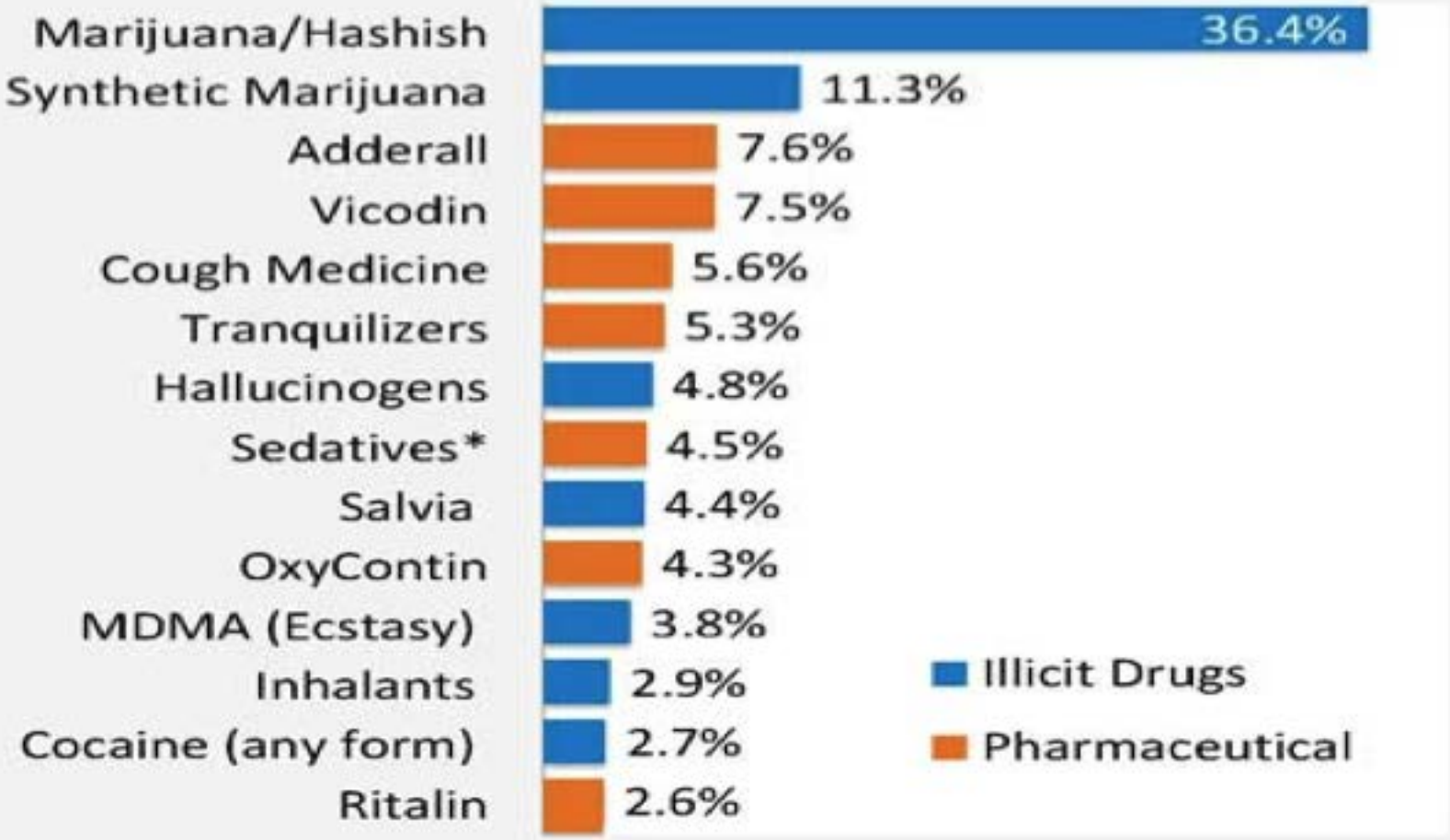
- Marijuana is THE most commonly used illicit drug.
  - 7% of the population report use in the past month
    - (18.1 million users)
  - About two-thirds of illicit drug users used only marijuana in the past month

Past Month Use of Selected Illicit Drugs Among Youths Aged 12 to 17: 2002-2011



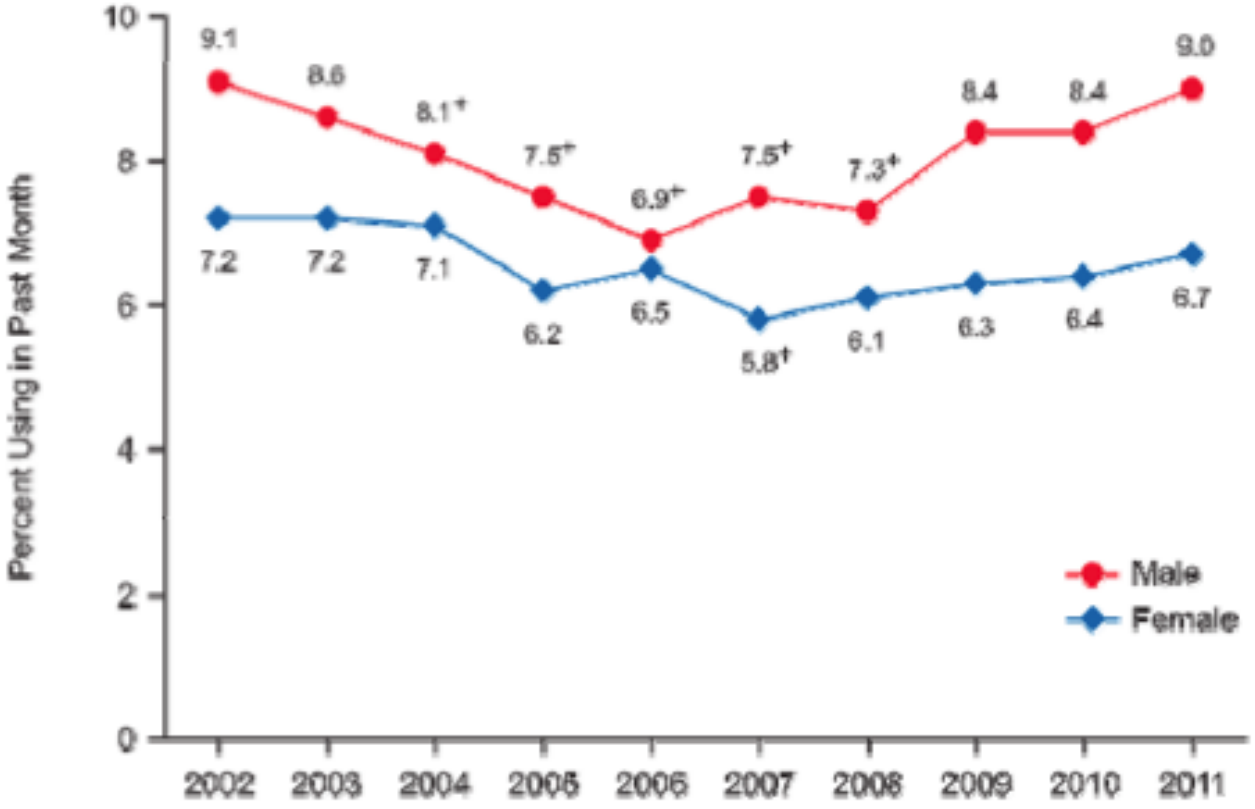
SAMHSA - 2011 National Survey on Drug Use and Health

Past-Year Use of Illicit Drugs and Pharmaceuticals among 12th Graders



SOURCE: University of Michigan, 2012 Monitoring the Future Study

Past Month Marijuana Use among Youths Aged 12 to 17, by Gender: 2002-2011



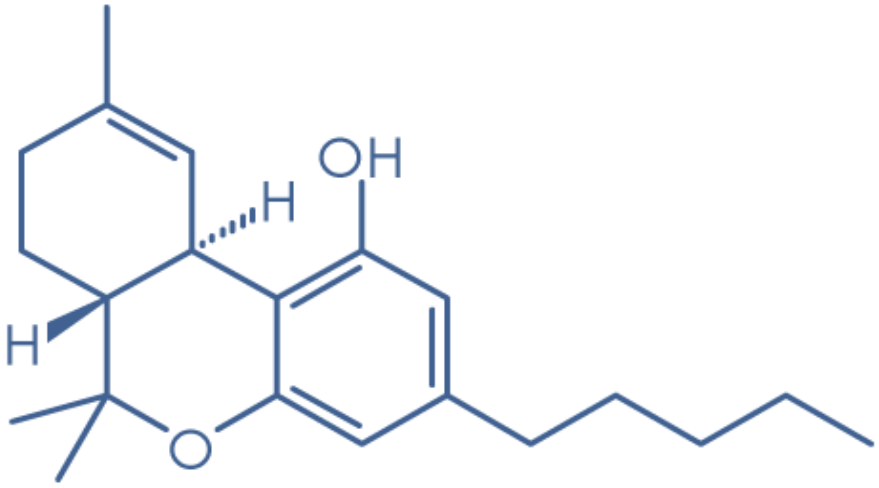
MARIJUANA

- Dried flower remnants of *Cannabis sativa* plant
  - Hashish – more concentrated, resinous form
  - Hash oil – sticky, black liquid
- *Cannabis* species can contain >60 cannabinoids (which are aryl-substituted meroterpenes)
  - Most potent and psychoactive cannabinoid – delta-9-tetrahydro-cannabinol – known as THC
    - Marijuana can be smoked in a "joint", or self-made cigarette, in pipes, or in "bongs"; can be eaten or baked into foods via extracting THC into butter or oil, as it is fat-soluble

www.drugabuse.gov/publications/drugfacts/marijuana

MARIJUANA

- THC acts on cannabinoid receptors in the brain
  - Ordinarily activated by chemicals called endocannabinoids (Anandamide)
    - Plays a role in normal brain development and function
      - Influences pleasure, memory, thinking, concentration, sensory and time perception and coordinated movement



Molecular structure: Δ9-THC
Molecular formula: $C_{21}H_{30}O_2$ Molecular weight: 314.4 g/mol

MARIJUANA LEGAL STATUS

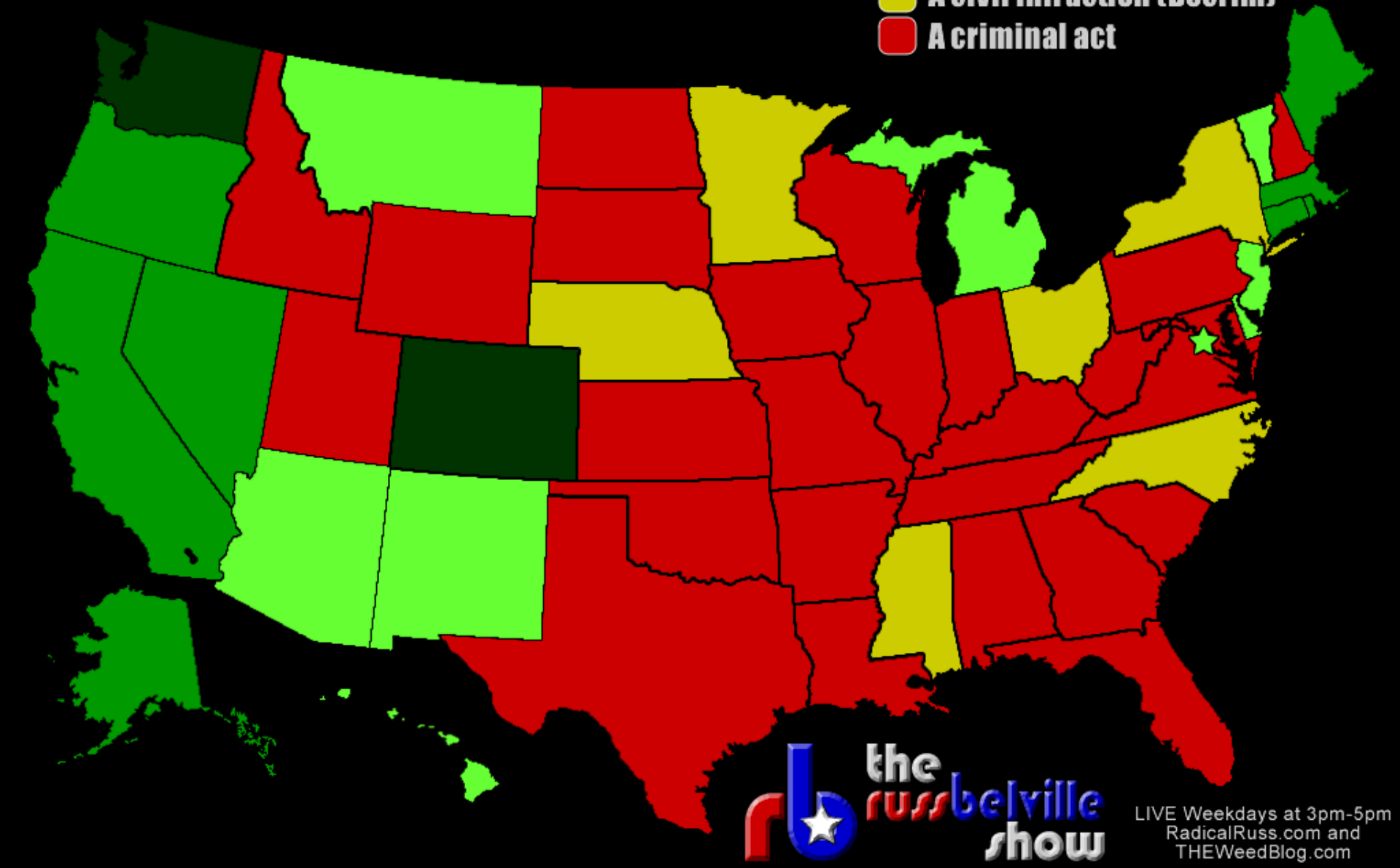
- Schedule I Substances in US - Illegal if found in possession
  - 18 states and District of Columbia – have legalized/decriminalized medical cannabis

Controlled Substance Schedules. US Department of Justice, Drug Enforcement Administration. Last reviewed: Sept 2012. Available at: www.deadiversion.usdoj.gov/schedules/index.html.

In 2013 in the United States of America, possession of 1 ounce* of marijuana is

*Limits on medical marijuana possession range from 1-24 ounces in 18 medical marijuana states; limits on personal possession range from 0.5-3.5 ounces in 15 decriminalized states

- Legal for Adults & for Medical Use
- Allowed for Medical Use & Decrim
- Allowed for Medical Use Only
- A civil infraction (Decrim)
- A criminal act



the russbelville show

LIVE Weekdays at 3pm-5pm
RadicalRuss.com and
THEWeedBlog.com

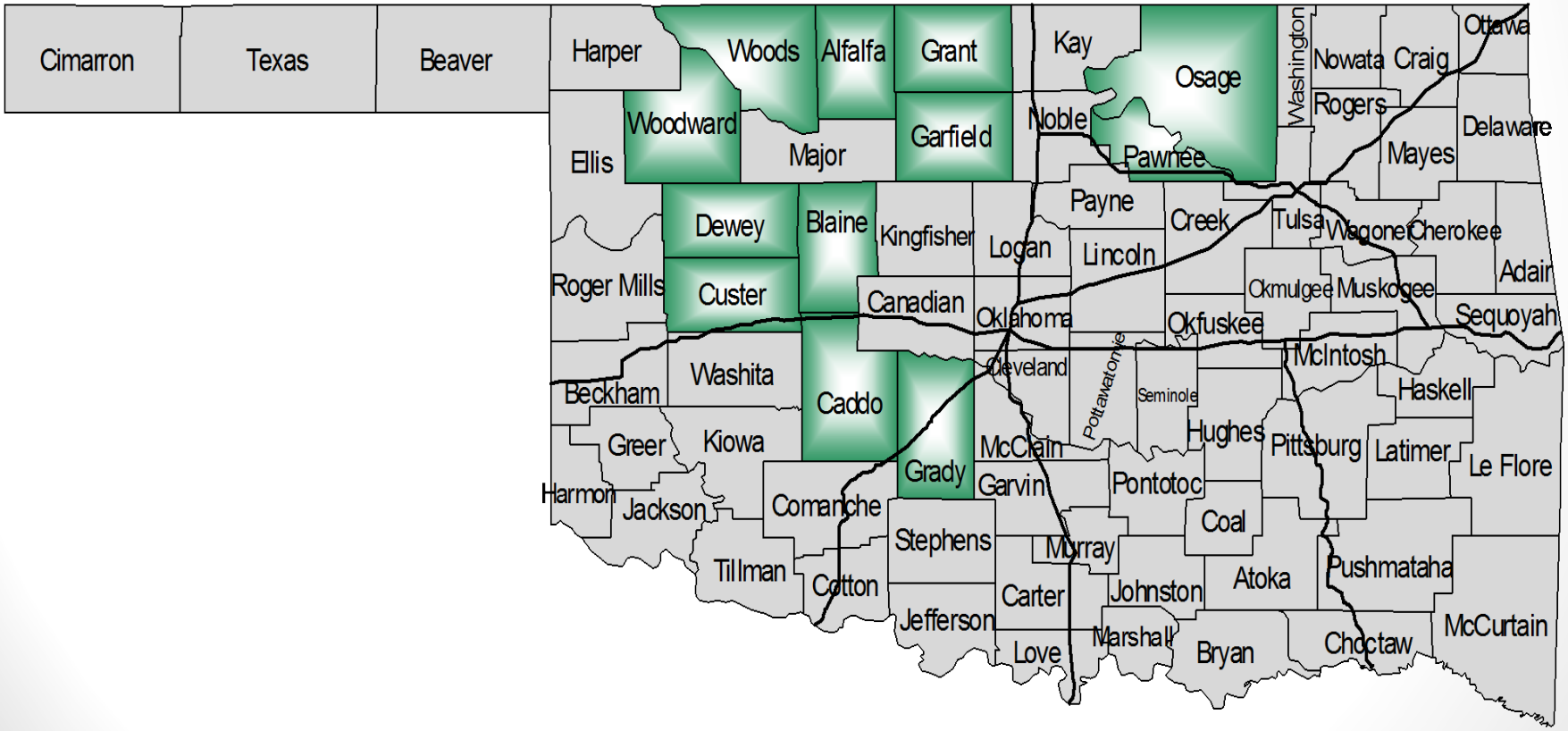
MEXICAN MARIJUANA GROWING OPERATIONS INCREASING

13,000 plants near Skiatook, OK

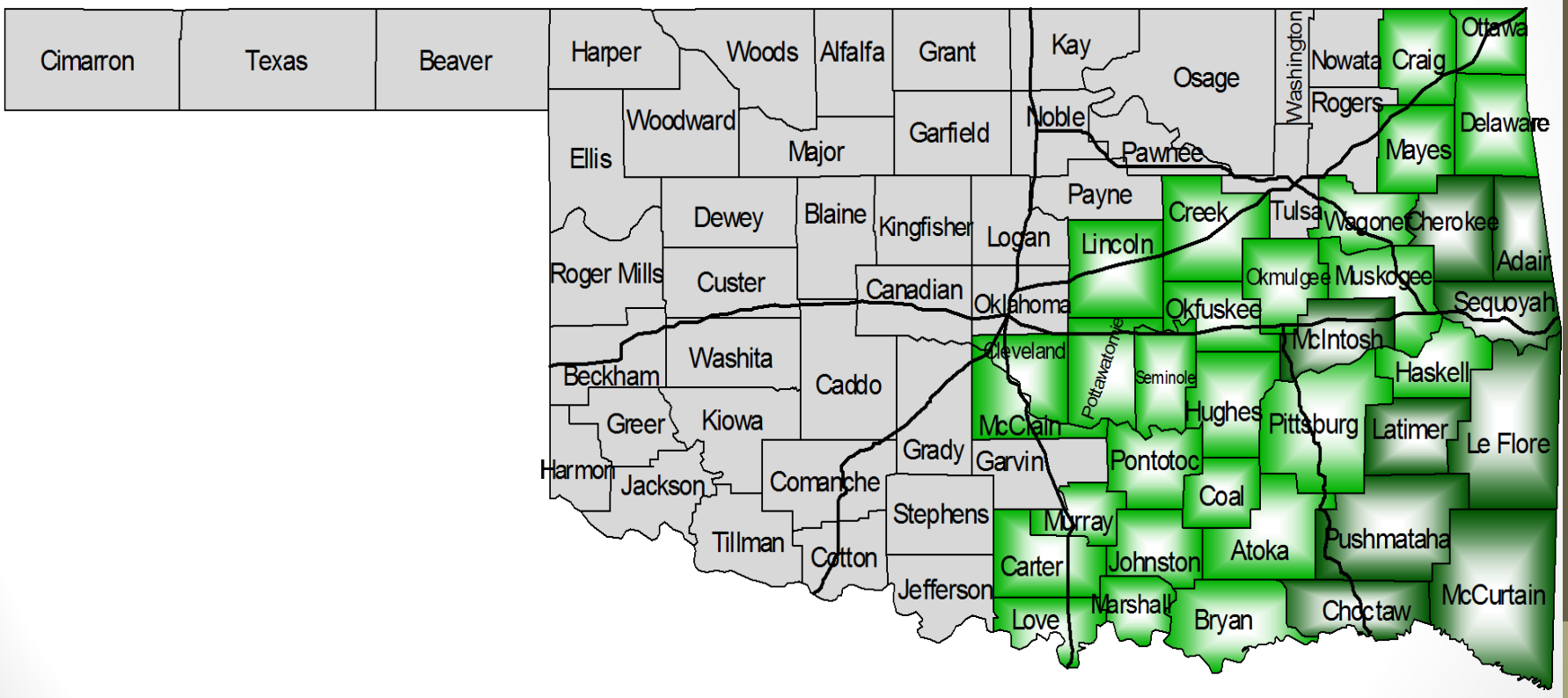
"Mexican Mafia" growers living in a patch near Carnegie

32,000 plants in the Kiamichi Mountains

PROMINENT WILD GROW COUNTIES



PROMINANT CULTIVATION COUNTIES



HEALTH EFFECTS OF MARIJUANA

- Chronic users
  - Adverse effect on learning and memory
    - When use begins in adolescence, effects may persist for many years
    - May have long lasting negative impact on structure and function of the brain

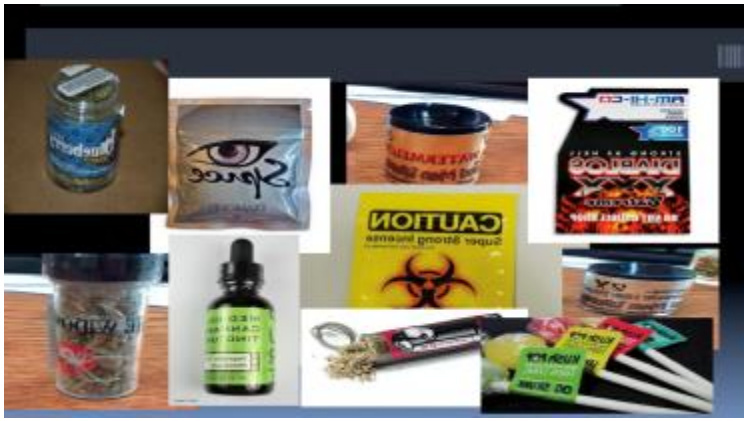
SYNTHETIC CANNABINOIDS

- Spice, K2, Genie, Yucatan fire, Zohai – around since 1993
  - Multiple chemical derivations
  - Professor John W. Huffman – developed JWH-018
    - One of the first and most famous synthetic cannabinoids
  - Not detected on routine drug tests
    - These test for THC

ACOEM MRO Update, June 2012

ORGANIC AND SYNTHETIC CANNABINOID USE IN ADOLESCENTS

- CDC Survey, 2012
  - 39.9% of adolescents have used marijuana at least once
    - 23.1% have used it regularly within the last month
  - 11.4% of US 12th graders have used "Spice", or "K2" (brand names of synthetic cannabinoids) in the past year.
    - **This makes synthetic cannabinoids the 2nd most commonly used illicit drug among high school seniors**



Synthetic Drugs (a.k.a. K2, Spice, Bath Salts, etc.) Office of National Drug Control Policy. Available at www.whitehouse.gov/ondcp/ondcp-fact-sheets/synthetic-drugs-k2-spice-bath-salts.

SYNTHETIC CANNABINOIDS

- Synthetic Cannabinoids
  - Nonorganic Cannabinoids that are synthesized and sprayed onto dried herbs or concentrated into powder forms
  - Advertised and sold as incense products
    - Common Brand Names: “Spice”, “K2”, “Genie”, “Aroma”
  - Sold in Head Shops, Convenience Stores, Internet
  - Used in ways similar to marijuana or through insufflation for psychoactive effects similar to THC
  - Do not contain THC - Contain other cannabinoids, as well as other unknown substances
  - Normally labeled, **“NOT FOR HUMAN CONSUMPTION”**

SYNTHETIC CANNABINOIDS

- Structurally diverse
  - Bind to cannabinoid receptors
  - Create similar effects to that of naturally occurring cannabinoids (marijuana).
  - More than 250 different synthetic cannabinoids have been created (mostly created in laboratories for research purposes)
    - Were tested on animals, not on humans
    - We do not know the long term effects
  - Psychoactive compounds found in Generation 1 of Spice and K2 include synthetic cannabinoids JWH-018, JWH-073, JWH-250, CP 47, 497, and/or CP 47, 497 C8.
  - Other synthetic cannabinoids include JWH-019, JWH-081, JWH-200, HU-210, CP 55, 940

SYNTHETIC CANNABINOIDS LEGAL STATUS

- Synthetic Cannabinoids
  - Banned throughout the U.S.
  - First synthetic cannabinoid – make in 1995 by a Clemson University Professor
    - Published a paper containing a description of the method and ingredients required
    - Cannabinoids 1st appeared in the European "party scene" before becoming more commonly known and used
  - Often altered to avoid federal regulations and bans
    - New cannabinoids are frequently being created
    - Currently – more than 100 compounds with cannabinoid-like activities waiting for identification

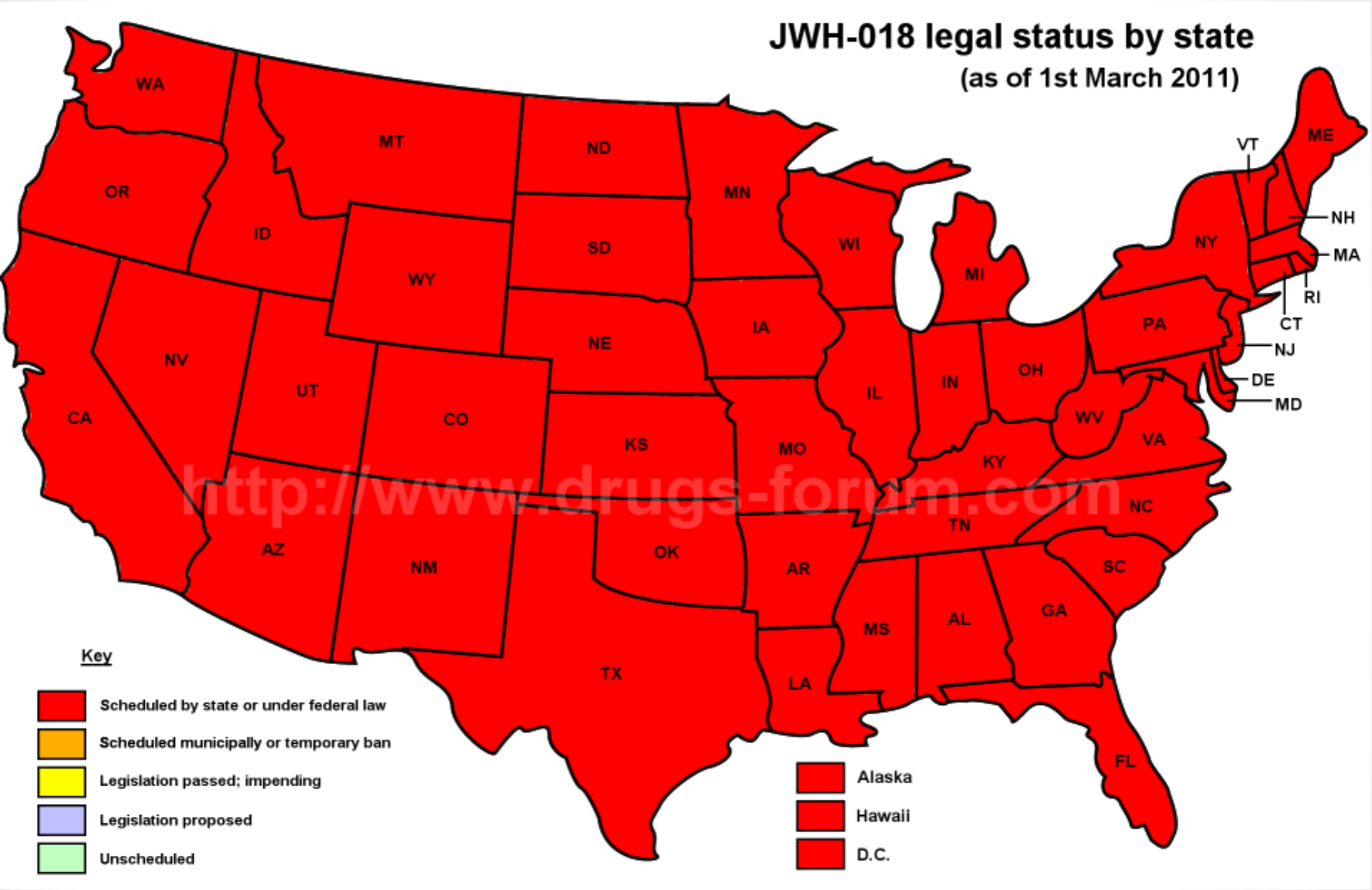
Controlled Substance Schedules. US Department of Justice, Drug Enforcement Administration. Last reviewed: Sept 2012. Available at: www.deadiversion.usdoj.gov/schedules/index.html.

SYNTHETIC CANNABINOIDS LEGAL STATUS

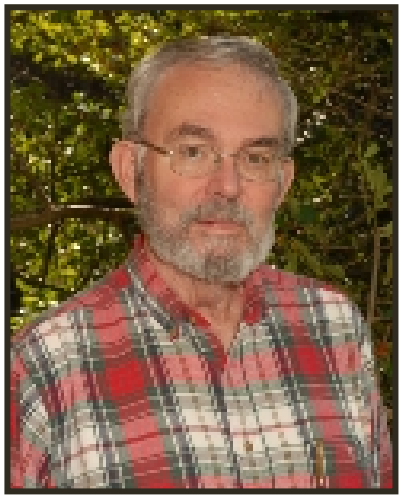
- 2011 – DEA – temporarily banned 5 synthetic cannabinoids
  - JWH-018
  - JWH-073
  - JWH-200
  - CP-47, 497
  - CP-47, 497 – C8

- Ban – effective at least 2 years
  - Makes this class of drugs Schedule I
  - However, as mentioned, new cannabinoids can be made by altering the original molecules, and thus, can effectively bypass the ban

Controlled Substance Schedules. US Department of Justice, Drug Enforcement Administration. Last reviewed: Sept 2012. Available at: www.deadiversion.usdoj.gov/schedules/index.html.


JWH-018 legal status by state
(as of 1st March 2011)
WA
OR
CA
ID
NV
MT
WY
UT
AZ
CO
NM
ND
SD
NE
KS
OK
TX
MN
IA
MO
AR
LA
WI
IL
MS
MI
IN
KY
TN
AL
OH
WV
GA
FL
SC
NC
VA
PA
NY
VT
ME
NH
MA
RI
CT
NJ
DE
MD
Key
Scheduled by state or under federal law
Scheduled municipally or temporary ban
Legislation passed; impending
Legislation proposed
Unscheduled
Alaska
Hawaii
D.C.
http://www.drugs-forum.com

SYNTHETIC CANNABINOIDS

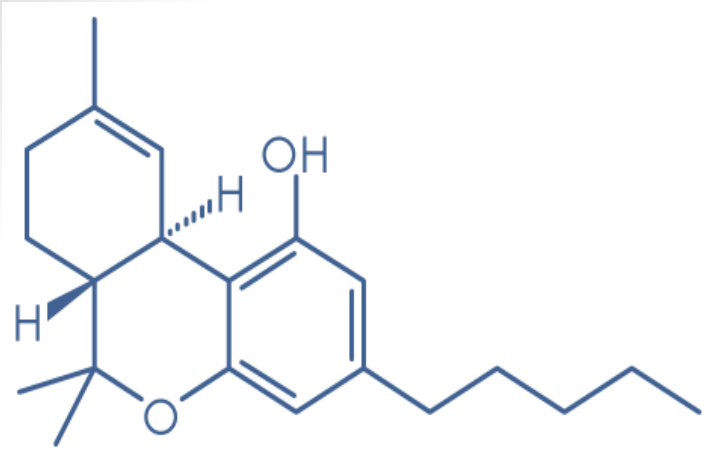


John W. Huffman, the scientist who is often credited with creating synthetic marijuana on a federal drug grant to study the effects of drugs on receptors in the brain on lab animals, has recommended that people don't ingest the compounds.

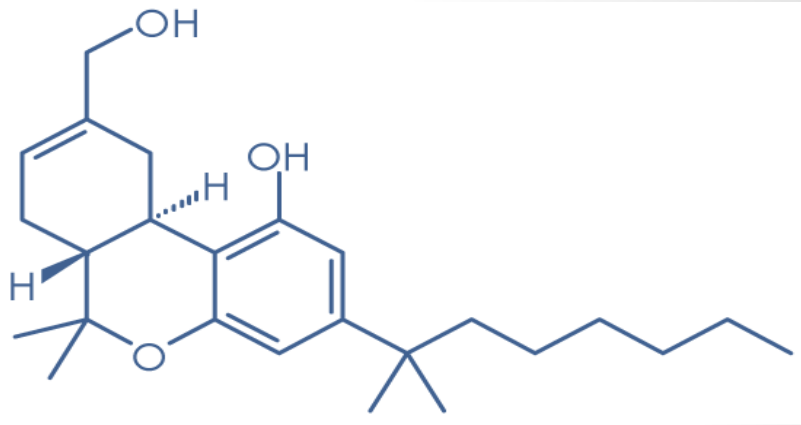
"These things are dangerous -- anybody who uses them is playing Russian roulette," Huffman said to the Los Angeles Times in 2011.

MARIJUANA AND SYNTHETIC CANNABINOIDS

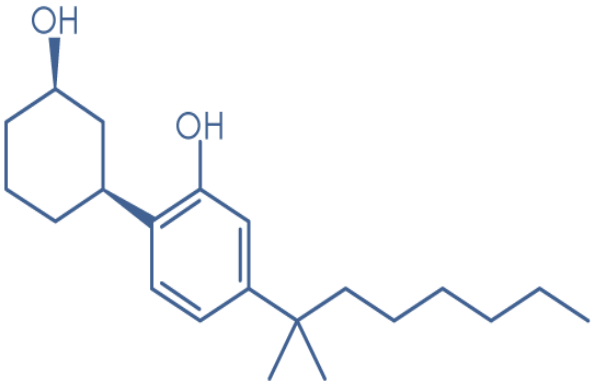
ARE THEY THE SAME?



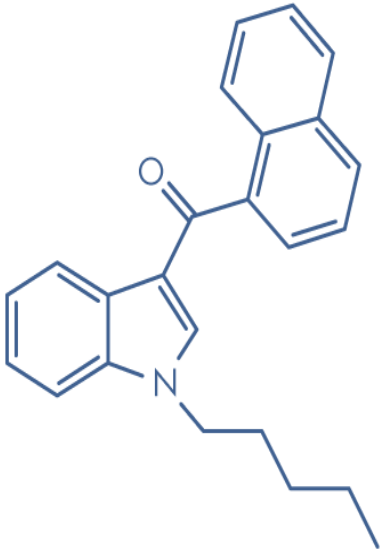
Molecular structure: Δ9-THC
Molecular formula: $C_{21}H_{30}O_2$ Molecular weight: 314.4 g/mol



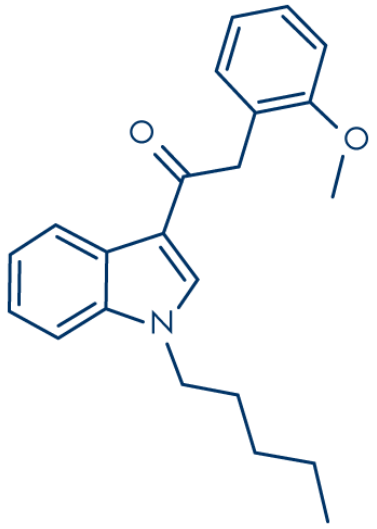
Molecular structure: HU-210
Molecular formula: $C_{25}H_{38}O_3$ Molecular weight: 386.6 g/mol



Molecular structure: CP 47,497
Molecular formula: $C_{21}H_{34}O_2$ Molecular weight: 318.5 g/mol

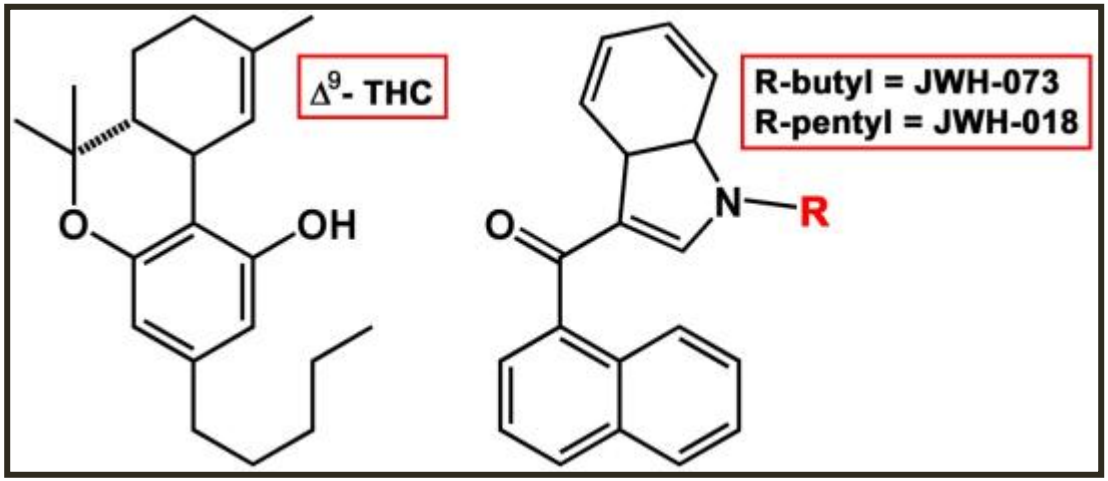


Molecular structure: JWH-018
Molecular formula: $C_{24}H_{23}NO$ Molecular weight: 341.5 g/mol



Molecular structure: JWH-250
Molecular formula: $C_{22}H_{25}NO_2$ Molecular weig

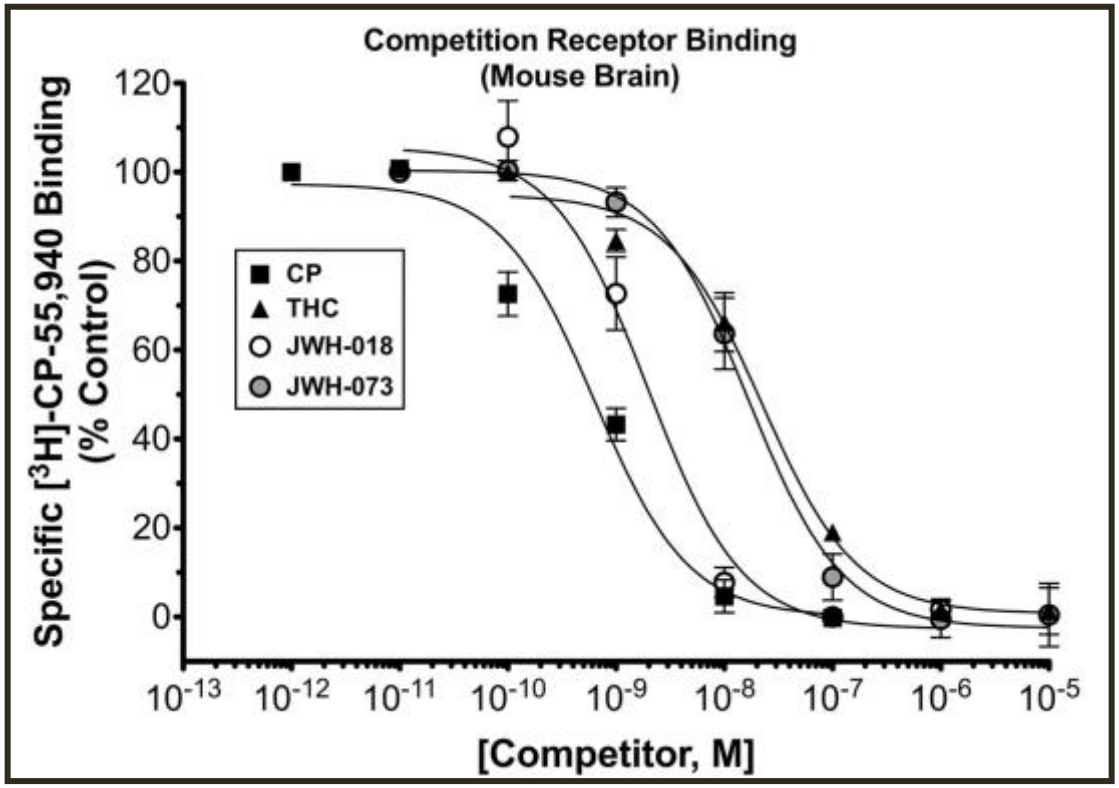
MARIJUANA AND SYNTHETIC CANNABINOIDS



Many of these compounds are a simplification of the WIN-55,212 structure, which had the highest affinity for CB1 receptors, and the best selectivity for CB1 over CB2.

Synthetic Drugs, Office of National Drug Control Policy, Dec 2012

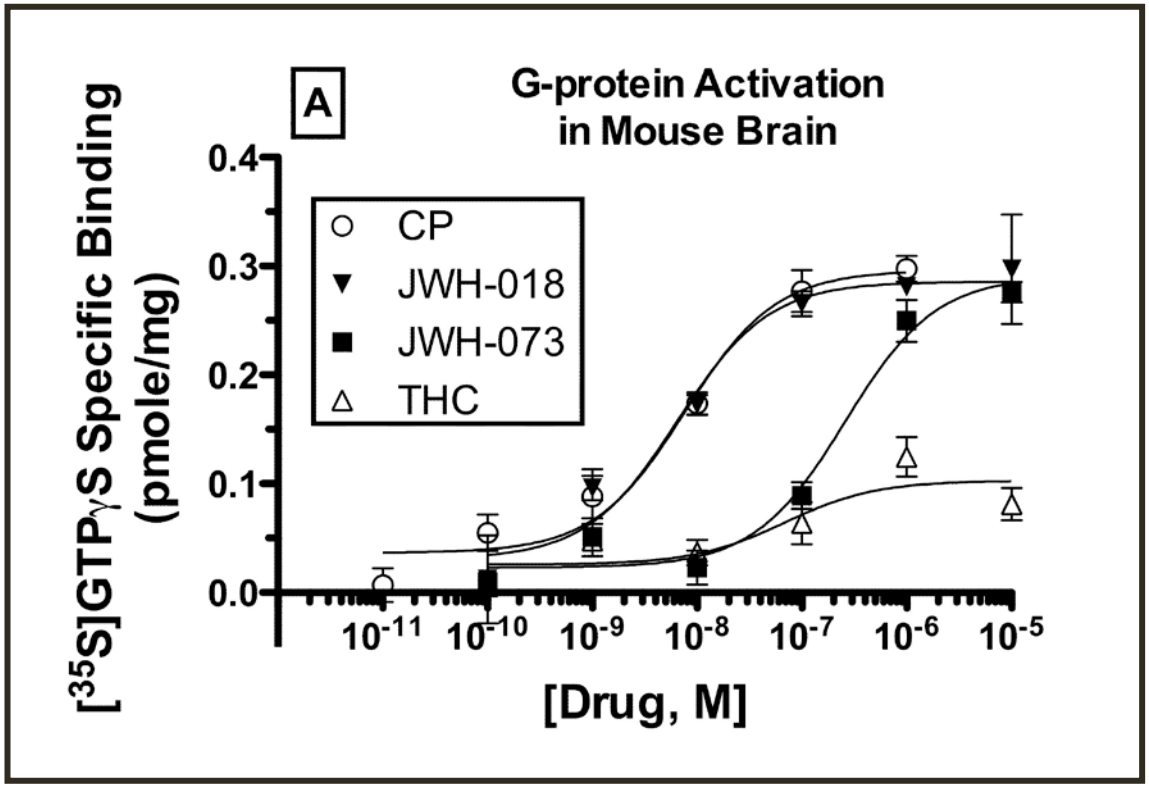
MARIJUANA AND SYNTHETIC CANNABINOIDS



Synthetics have higher (JWH-018) or comparable (JWH-073) affinity to D^9-THC.

Synthetic Drugs, Office of National Drug Control Policy, Dec 2012

SYNTHETIC CANNABINOIDS AND MARIJUANA



Synthetics are full CB1 agonists, while D^9-THC is a partial CB1 agonist.

Synthetic Drugs, Office of National Drug Control Policy, Dec 2012

SYNTHETIC CANNABINOIDS

- Synthetic cannabinoids exploit a "legal grey area" as novel pharmacological entities with unknown chemical structures and unknown biological effects.
- Regulatory efforts to curtail availability have largely failed – as individual compounds are scheduled, new ones emerge to take their place.
- Increased potency and (in some cases) efficacy of novel drugs increases risk of overdose and adverse reaction.
  - Binding affinity to CB1 receptors have been reported to be up to 300 x that of THC in some cases
- Huge profit margin motivates sellers, and ease of acquisition motivates users.
- The continued emergence of novel drugs of abuse is likely to continue for some time.

MARIJUANA AND SYNTHETIC CANNABINOIDS

USE, ABUSE, AND DEPENDENCE

MARIJUANA

- Marijuana Intoxication
  - Develops during or shortly after use
    - Described as Euphoria, Anxiety, Sensation of slowed time, Impaired motor coordination, and/or social withdrawal
- Physiologic symptoms – Occur within 2 hours of use
  - Conjunctival injection, Increased appetite, Dry mouth, Tachycardia

MARIJUANA

- Marijuana Abuse
  - Maladaptive pattern of use leading to *clinically significant impairment or distress during a 12-month period, manifested either by:*
    - Recurrent use that *interferes with* major role obligations at *work, school, or home*;
    - Occurs in situations in which it is *physically hazardous*;
    - Results in *legal problems* related to use;
    - Or *persistently occurs despite continued social or interpersonal problems* caused or exacerbated by the effects of the use
  - In addition – above criteria require that the symptoms mentioned *must have never met criteria for marijuana dependence*

American Psychiatric Association. *The Diagnostic and Statistical Manual of Mental Disorders, 4th Edition, Text Revision (DSM-IV TR).* Washington, DC: American Psychiatric Association Press; 2000

MARIJUANA

- Marijuana Dependence
  - Maladaptive pattern of use resulting in clinically significant impairment or distress in a *12-month period with 3 symptoms that signify tolerance, including:*
    - Markedly *increased amounts* of marijuana to achieve the desired effect or intoxication
    - Markedly *diminished effect* with continued use of the same amount of marijuana
    - Being used in *larger amounts* or over a *longer period* than was intended
  - Symptoms also include:
    - A persistent desire and unsuccessful efforts to cute down or control use
    - Spending great deal of time in obtaining, using it, or recovering from its effects

American Psychiatric Association. *The Diagnostic and Statistical Manual of Mental Disorders, 4th Edition, Text Revision (DSM-IV TR).* Washington, DC: American Psychiatric Association Press 2000

MARIJUANA

- Marijuana
  - Due to its increase in potency:
    - More likely to build tolerance in users
    - May result in increased withdrawal symptoms
    - Dependence - Likely to be a bigger issue now than it has been in the past

MARIJUANA

- DSM-IV-TR Marijuana Dependence Criteria
  - Only includes physiologic tolerance
    - Does not specify a withdrawal period
  - However, results from a recent US epidemiological survey suggests that a withdrawal period does exist
    - Among frequent users who did not use other substances:
      - 44% - Reported 2 or more withdrawal symptoms with discontinuation
      - 34% - Reported 3 or more withdrawal symptoms with discontinuation
    - Most prevalent withdrawal symptoms included:
      - Fatigue
      - Hypersomnia
      - Psychomotor Retardation
      - Anxiety
      - Depression
      - Yawning

Hasin DS, Keyes KM, Alderson D, et al. Cannabis withdrawal in the United States: results from NESARC. *J Clin Psychiatry.* 2008; 69:9

MARIJUANA

- Marijuana Withdrawal
  - Can be distressing, but not life-threatening
  - Symptoms begin the day or so after cessation – peaks between days 2 and 6, and resolves within 1 to 2 weeks.
    - Sleep disturbances and irritability may continue to persist for weeks
      - Possibly due to THC being lipophilic and redistributing quickly into body fat
      - High lipid storage of THC increases its elimination half-life - may immediately diminish the severity of withdrawal symptoms, while possibly extending their duration

MARIJUANA

- DSM-5 – Changes to the category of substance use disorders
  - Combines DSM-IV-TR categories of substance abuse and substance dependence
    - The American Psychiatric Association believes that by combining the criteria, the diagnoses will be strengthened and more accurate.
      - Example – Previous substance abuse criteria required only 1 symptom, while the DSM-5 mild substance use disorder will require 2-3 symptoms
  - Acknowledges Cannabis Withdrawal Syndrome
    - "Common symptoms of withdrawal include irritability, anger or aggression, anxiety, depressed mood, restlessness, sleep difficulty, decreased appetite or weight loss".
    - Can cause significant distress
    - Can contribute difficulty quitting or relapse among those trying to quit

Diagnostic and Statistical Manual of Mental Disorders. 5th Edition. DSM-5. American Psychiatric Association. 2013

MARIJUANA – RISKS OF USE

- Risks of marijuana use
  - Fall into 2 domains:
    - Physical
    - Psychological
  - More is known about effects of organic cannabinoid use, versus synthetic cannabinoid use

MARIJUANA – RISKS OF USE

- Organic Cannabinoid Use – Physical Domain
  - Pulmonary Risks
    - Found to be no association between long-term marijuana smoking and airflow obstruction measures
    - Long-term smoking was associated with increased respiratory symptoms, including cough, phlegm, and wheezing
  - Cancer Risks
    - 2005 Review of Epidemiologic Studies
      - Concluded that there were not sufficient studies available to adequately evaluate the effect of marijuana use on cancer
  - Immune System Risks
    - Multiple studies
      - Cannabinoids may suppress immunological function
  - Periodontal Disease
    - Marijuana smoking is implicated in having an increased risk of periodontal disease in chronic users

Tetrault JM, et al. Effects of marijuana smoking on pulmonary function
And respiratory complications: a systematic review. *Arch Intern Med.* 2007; 167 (3): 221-228

MARIJUANA – RISKS OF USE

- Organic Cannabinoid Use – Psychological Domain
  - In a Recent Study:
    - Persistent Organic Marijuana Use – Associated with **neuropsychological decline** that occurred across all domains of functioning
      - **Impairment** – was concentrated among adolescent-onset organic marijuana users, with **more persistent use associated with greater decline**.
      - **Cessation of Use – Did not fully restor*e* neuropsychological functioning** among adolescent-onset organic marijuana users
    - Results of this study – Negated previously held notions, which stated that there was no evidence of significant long-term effects of persistent organic marijuana use on neurocognitive processes

Sanaa Bhatty, MD. Organic and Synthetic Cannabinoid Use in Adolescents. *Pediatric Annals*. 42:1. January, 2013

MARIJUANA – RISKS OF USE

- Organic Cannabinoid Use – Psychological Domain
  - Recent Studies:
    - Marijuana use has been found to show an increased risk of psychosis
      - Greater risk in those who use marijuana most frequently
    - Psychosis or Schizophrenia-related illnesses have been shown to occur 2.7 years earlier in those who abused marijuana
      - Signifies a possible causal role of marijuana in inducing psychosis or schizophrenia-related illness
    - Genetic predisposition may influence risk of developing psychosis in those who used marijuana as adolescents

Large M, Sharma S, Compton MT, et al. Cannabis use and earlier onset of psychosis: a systematic Meta-analysis. *Arch Gen Psychiatry.* 2011; 68 (6): 555

SYNTHETIC CANNABINOIDS

- Synthetic Marijuana Intoxication
  - There's a lack of DSM-IV-TR criteria for synthetic marijuana intoxication, abuse, or dependence.
  - Has been reported to lead to:
    - Conjunctival Injection
    - Tachycardia
    - Anxiety
    - Aggressive behavior
    - Paranoia
    - Hallucinations
    - Inability to Speak
    - Dystonia
    - Short term memory deficits

  - There are also reports that demonstrate a withdrawal syndrome, and thus, a level of tolerance from synthetic marijuana use.

Fattore L, Fratta W. Beyond THC: the new generation of cannabinoid designer drugs. *Front Behav Neurosci.* 2011;5:60.

SYNTHETIC CANNABINOIDS RISKS OF USE

- Synthetic Cannabinoids – Risks of Use
  - Less known about long-term effects
    - Due to recent introduction to the public
  - Multiple reports of psychotic symptoms occurring in individuals who used synthetic cannabinoids that have occurred after the acute effects of intoxication.
  - Have also been reports of deaths, some of which were due to suicide, and others due to ischemic cardiac events

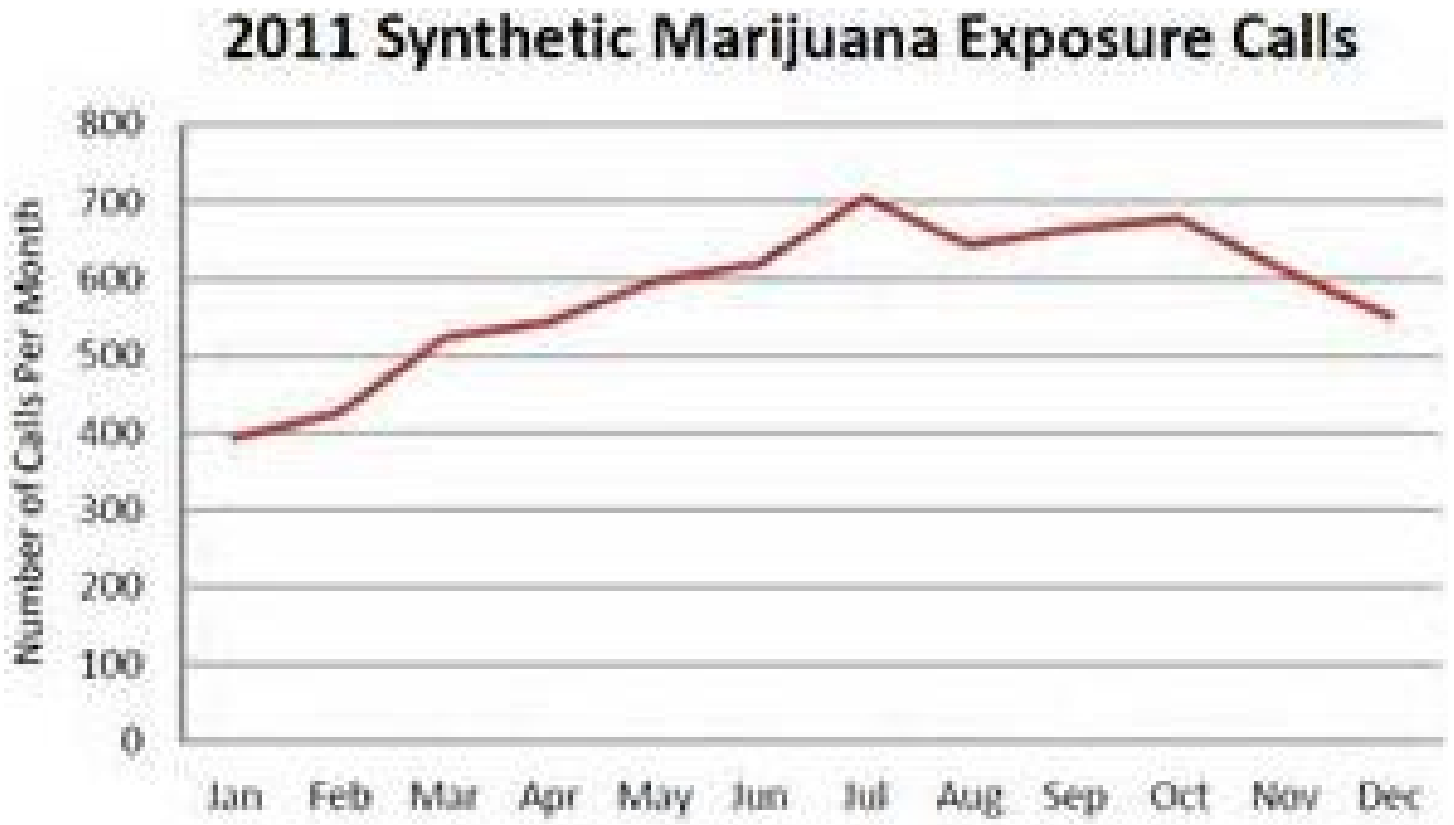
Fattore L, Fratta W. Beyond THC: the new generation of cannabinoid designer drugs. *Front Behav Neurosci.* 2011; 5:60.

SYNTHETIC CANNABINOIDS RISKS OF USE

- These synthetic drugs can be extremely dangerous and addictive. Health effects from the drug can be life-threatening
- Poison center experts – as well as many federal, state, and local government officials – have called synthetic drug use a risk to the public's health and a hazard to public safety.
- The harmful effects from these products were first reported in the U.S. in 2009. Since then, the drugs have spread throughout the country.
- Poison centers received 5,230 calls about exposures to these drugs in 2012 alone.

Poison Control Center, 2012

SYNTHETIC CANNABINOIDS RISKS OF USE



Report from Poison Control Center, 2011

SYNTHETIC CANNABINOIDS RISKS OF USE

- **Reported Toxic Effects by Poison Control Center**
  - **Cardiac Arrest**
  - Heart Attacks
  - Vomiting
  - Strokes
  - Increased Blood Pressure
  - Increased Heart Rate
  - Partial Paralysis
  - Increased Body Temperature
  - Temporary Inability to Feel Pain
  - Seizures
  - Paranoid Delusions
  - Depression
  - Hallucinations
  - Exaggerated Thoughts of Suicide
  - Feeling of Impending Doom (Death)
  - Tremors
  - Panic Attacks
  - Excessive Sweating
  - **Kidney Failure**

Side effects may continue for several months! If you see someone with these symptoms, call 911 or Poison Control at 800-222-1222.

MYOCARDIAL INFARCTION ASSOCIATED WITH SYNTHETIC CANNABINOID USE

- Results from a 2011 Study, published in *Pediatrics*, Volume 128, Number 6, Dec 2011 (Authors: Arshid Mir, MD, Adebisi Obafemi, MD, et. al)
  - Effects of synthetic cannabinoids reported as "cannabis-like" after smoking them
  - Reported 1st cases known of myocardial infarction (MI) after smoking K2.
  - 3 patients presented separately to ER with chest pain within days after K2 use
  - Acute MI was diagnosed in each case on basis of ECG changes and elevated troponin levels
  - Coronary angiography was performed, and results were normal for 2 of the 3 cases
  - Incidence of ST-elevation MI is low among teenagers, and association with drug use should be suspected

Arshid Mir, MD, Adebisis, MD, et. al. Myocardial Infarction Associated With Use of the Synthetic Cannabinoid K2. *Pediatrics* Volume 128, Number 6, Dec 2011

MYOCARDIAL INFARCTION ASSOCIATED WITH SYNTHETIC CANNABINOID USE

- Discussion from 2011 Study, Continued
  - Ischemic chest pain in pediatric population is uncommon, and MI is exceedingly rare
    - Among drugs of abuse, marijuana and cocaine have led to MI in adolescents
      - THC has been shown to increase cardiac output by as much as 30%
      - Marijuana can increase heart rate from 20% to 100% in a dose-dependent manner, which leads to increased oxygen demands on the myocardium
      - Smoking marijuana also leads to an increase in carboxyhemoglobin levels
      - Interference with the integrity of peripheral vascular response has been postulated to be one of the pathophysiological mechanisms for cardiac events during cannabis smoking

Arshid Mir, MD, Adebisis, MD, et. al. Myocardial Infarction Associated With Use of the Synthetic Cannabinoid K2. *Pediatrics* Volume 128, Number 6, Dec 2011

MYOCARDIAL INFARCTION ASSOCIATED WITH SYNTHETIC CANNABINOID USE

- Discussion from 2011 Study, Continued
  - Because synthetic cannabinoids do not currently show on routine toxicology screening tests, questioning is necessary to elicit history of exposure to K2 or similar products
  - Pediatricians and other health care providers in primary care, specialty care, and emergent/urgent care should be on alert for drug-induced toxicities, despite negative drug screen results
  - Cases should be reported to local health authorities, national-level authorities including poison control centers, and the Drug Enforcement Administration
  - Further research is needed to evaluate the toxic effects of synthetic cannabinoids
    - Education for parents, health care workers, and adolescents about potential health risks from using synthetic cannabinoids is essential
- ***"K2 is not a safe, undetectable form of fake marijuana, but rather, a potent and potentially harmful drug of abuse"***

Arshid Mir, MD, Adebisis, MD, et. al. Myocardial Infarction Associated With Use of the Synthetic Cannabinoid K2. *Pediatrics* Volume 128, Number 6, Dec 2011

MARIJUANA AND SYNTHETIC CANNABINOID USE IN ADOLESCENTS

Prevention, Intervention, and Treatment

PREVENTION

- Prevention is Key in the Adolescent Population
  - Multiple studies indicate that educating adolescents on presence and effects of organic and synthetic cannabinoids may help reduce their use
  - Protective factors may also help deter from substance abuse
    - adequate self control, parental support and supervision, academic competence and achievement, anti-drug use policies and education, strong community and neighborhood attachments, and access to health services
- Programs look to build on identified protective factors
  - Programs aim at stopping the use of tobacco amongst youth.
  - Educating parents to their role in prevention – setting of expectations and boundaries.

PREVENTION

- Association of risk is a protective factor
  - Programs aimed at educating youth to the damage caused by drug is helpful, however, getting them to buy into the truth of this information can be difficult.

PREVENTION

- NIDA – Preventing Drug Use among Children and Adolescents: A Research-Based Guide for Parents, Educators, and Community Leaders
  - Validated programs that have shown positive results
  - Available online

www.drugabuse.gov/publications/science-addiction/preventing-drug-abuse-best-strategy

PREVENTION

- National Institute on Drug Abuse
  - NIDA Goes to School Initiative – site for grade school, middle school, and high school students and teachers to order free resources for their own use or for use in classrooms

http://www.drugabuse.gov/publications/science-addiction/advancing-addiction-science-practical-solutions

PREVENTION

- NIDA for Teens: The Science Behind Drug Abuse – An interactive website geared specifically for teens, with age-appropriate facts on drugs.
- Heads Up: Real News About Drugs and Your Body – A drug education series created by NIDA and SCHOLASTIC INC. for students in grades 6 to 12.

PREVENTION

- http://www.drugfree.org/
  - The Partnership at Drugfree.org
    - Good website for parents

MARIJUANA INTERVENTION

- Marijuana
  - 1st Step → Screen those who have admitted to organic or synthetic marijuana use
  - Determine if they meet criteria for abuse or dependence
- For use that is suspected, but not admitted → Drug Test
  - Also helpful for monitoring progress during treatment
  - Urine Drug Testing
    - Most Commonly Used, Readily Available, Inexpensive
    - **+ test only establishes past use**
      - **+ up to 7-10 days in casual user**
      - **+ 2-4 weeks in heavy user**
      - **+ for months in chronic heavy user**

SYNTHETIC CANNABINOID INTERVENTION

- Synthetic Cannabinoids
  - Currently, there is no widespread commercially available drug testing for synthetic cannabinoids
  - Often are chemically altered to avoid legal bans → difficult to test for all cannabinoids currently available
  - Some tests are available for known and banned synthetic cannabinoids, such as JWH-018 and JWH-073
    - However – not easily available, nor necessarily conclusive of use

DuPont JL, Bailey JA, et al. Cannabis use disorders: clinical features and diagnosis. *UpToDate.* Waltham, MA: UpToDate; 2012

SYNTHETIC CANNABINOID INTERVENTION

2013 RML Urine Panel for Synthetic Cannabinoids

- **Available Tests:**
  - JWH 018 N (4 Hydroxypentyl) Metabolite
  - JWH 018 N (5 Hydroxypentyl) Metabolite
  - JWH 073 N (3 Hydroxybutyl) Metabolite
  - JWH 073 N (4 Hydroxybutyl) Metabolite
  - AM 2201 N (4 Hydroxypentyl) Metabolite
  - JWH 019 N (5 Hydroxyhexyl) Metabolite
  - JWH 250 N (4 Hydroxypentyl) Metabolite
- **Expected TAT**: 3-5 Days
- **CPT Code**: 80101
- **Clinical Use:**
  - "Synthetic Cannabinoids refer to a wide variety of herbal mixtures that produce experiences similar to cannabis that are marketed as legal alternatives to that drug. Sold under names, including "K2", "fake weed", "Yucatan Fire", "Skunk", "Moon Rocks", and "Spice", they are labeled "not for human consumption". Synthetic Cannabinoids are psychoactive designer drugs made with dried, shredded plan materials and chemical additives that induce psychoactive effects.

TREATMENT

- **Treatment of Acute Ingestion of Marijuana**
  - Place user in quiet, low-stimulation environment with gentle interactions until acute effects subside
  - Symptomatic Treatment
  - Close Observation
  - Low-dose Benzodiazepines or Antipsychotics
    - May be used for sedation, or to reduce paranoia or psychotic symptoms
- **Treatment of Acute Ingestion of Synthetic Cannabinoids**
  - Similar to that of Organic Cannabinoids
  - May require Longer Acting Benzodiazepines
- *In General → Acute Ingestion of Either Does Not Require Medical Treatment; However, users may seek treatment for dysphoria, severe paranoia, or psychotic symptoms*

TREATMENT

- **Organic Marijuana Abuse and/or Dependence**
  - **Standard Treatment – Psychotherapy**
    - Due to lack of effective pharmacological treatments
    - Recent double-blind, randomized, placebo-controlled study
      - Showed some benefit of N-acetyl cysteine in producing cessation in adolescents with marijuana dependence (in conjunction with psychotherapy)
  - **Psychotherapies with Positive Effects in Organic Marijuana Cessation**
    - Cognitive Behavioral Therapy
    - Family Therapy
    - Voucher-Based Incentives (ie, a behavioral therapy that uses rewards such as monetary vouchers as incentives for therapeutically desired behaviors)
    - Motivational Enhancement Therapy
  - **Marijuana Anonymous – Self Help Group**
    - However, no studies have been conducted to determine their effectiveness

Gray KM, Carpenter MJ, Baker NL, et al. A double-blind randomized controlled trial of N-acetylcysteine in cannabis dependent adolescents. *Am J Psychiatry.* 2012

TREATMENT

- **Synthetic Cannabinoid Abuse and/or Dependence**
  - Treatment
    - Could be similar to that of Organic Cannabinoids – Due to similar substance effects
    - Due to variable potencies of synthetic marijuana, however, as well as its fully not yet known properties, future studies may indicate other treatments necessary to combat its effects

CONCLUSIONS

- Organic and Synthetic Cannabinoid Use in the Adolescent Population has become increasingly prominent
- As the concentration of the active cannabinoid ingredient THC increases in organic use, the effects of marijuana abuse and/or dependence are worsened
- Recent rise of synthetic use and its lack of regulation make it a new issue and, oftentimes, one that is difficult to detect
- Synthetic Cannabinoids have properties and effects similar to THC, but bind more actively to CB1 cannabinoid receptors in the brain
- Synthetic Cannabinoids were tested on animals, not on humans, and little is known about their effects on humans
- Synthetic Cannabinoids have been shown to be addictive, as well as dangerous
- Negative reported short term side effects of synthetic cannabinoids have been numerous, greater in comparison to THC, and life threatening in some cases
- It is far too early to say how long term use of synthetic cannabinoids can impact on an individual's physical and mental health.
- Prevention is Key!!!
- EDUCATE THE ADOLESCENT POPULATION OF THESE ILLICIT SUBSTANCES AND THEIR EFFECTS


ANY
QUESTIONS?