Spice/K2 – Abuse of Synthetic Cannabinoids

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Big News!!!

- November 24, 2010, the DEA, issued a notice of intent to temporarily place five synthetic cannabinoids into the Controlled Substances Act (CSA)
- synthetic cannabinoids treated as Schedule 1 drugs
  - a drug that has a high potential for abuse
  - a drug that has no currently accepted medical use in treatment in the United States
  - there is a lack of accepted safety for use of the drug under medical supervision
Big News!!!

- synthetic cannabinoids covered under the DEA’s proposed new rule includes the following:
  - JWH-018 *
  - JWH-073 *
  - JWH-200
  - CP-47,497
  - CP-47,497 (C-8 homologue)
Big News!!!

- DEA took action - imminent hazard to the public safety
- when finalized - impose criminal sanctions and regulatory controls of Schedule I substances under the CSA
- covers the manufacture, distribution, possession, importation, and exportation
- Christine Sannerud, Ph.D., Chief, Drug & Chemical Evaluation Section, Office of Diversion Control
- approximately 30 days until finalization
Ramifications of DEA Action:

- eliminate the commercial distribution of synthetic cannabinoids
- drive synthetic cannabinoids underground
- limit their availability
- impact on criminal justice - wait and see?
The Story of Designer Drugs
Designer Drugs:

Drugs, which are created (or reformulated, if the drug already existed) to get around existing drug laws (CSA), usually by modifying the molecular structures of existing drugs to varying degrees.
Designer Drugs:

- “designer drug” was first coined by law enforcement in the 1980s
- Second International Opium Convention in 1925 which specifically banned alternative esters of morphine
- 1960s - 1970s, new synthetic hallucinogens (modifications of LSD & PCP)
- 1980s - 1990s, design of MDMA (ecstasy) & methcathinone
- 2000 - 2005, derivatives of psilocybin & mescaline - anabolic steroid
Designer Drugs:

- most designer drugs have been:
  - opioids
  - hallucinogens
  - anabolic steroids

- 2005 - 2010
  - stimulants (DMAA)
  - sedatives (methyl-methaqualone)
  - Sildenafil citrate (designer Viagra)
  - synthetic cannabinoids
What Drives the Production of Designer Drugs?

- Consumer preferences
- Law enforcement control
Spice/K2 and Synthetic Cannabinoids
What’s in these “incense” products?
“Listed” Ingredients in Spice

- **Canavalia rosea**: commonly known as beach bean or bay bean - vine found in tropical and subtropical beach dunes
- **Nymphaea caerulea**: also known as Blue Egyptian water lily
- **Scutellaria nana**: perennial herb also known as Dwarf skullcap
- **Pedicularis densiflora**: known commonly as Indian warrior - a perennial herb
- **Leonotis leonurus**: also known as Lion's Tail and Wild Dagga - a perennial shrub native to southern Africa
- **Zornia latifolia**: is a perennial herb
- **Nelumbo nucifera**: known by a number of names including Indian Lotus, or simply Lotus - aquatic perennial commonly found in China
- **Leonurus sibiricus**: commonly called Honeyweed or Siberian motherwort, herbaceous plant native to Asia
- vanilla
- honey
Preparation of the “incense”:

- botanicals are sprayed with liquid preparations of:
  - HU-210
  - HU-211
  - CP 47,497
  - JWH-018
  - JWH-073
Where can these “incense” products be purchased?
Sources of Incense Products:

- “head” shops/alternative medicine stores
- 1-(800) phone ordering services
- individual distributors
How is herbal incense promoted?
The Directions:
More Directions:

There is 1.5g of Natural Super Puff in each package. Super Puff incense is an ultra strong aromatic incense, and is one of the world's strongest herbal incense blends available. It contains an extremely potent blend of herbal resins, extracts, and leaves. This incense is for botanical use only and is not for human consumption.
Terms:

You affirm and agree to the following:
That you are 18 years of age or older. NO EXCEPTIONS! You agree to use our products for their intended purposes only. You waive without exception your right to hold Seller liable in any way for the misuse of Seller’s products. Buyer understands that all of Seller’s products are offered for scientific research purposes only and that these products are not intended for human consumption. Buyer understands that Seller’s products are not meant for oral consumption or inhalation of smoke/hot vapors. The Seller does NOT supply instructions on proper use of any product provided.
What’s the story behind these synthetic THC chemicals?
Synthetic Cannabinoids

- HU-210
- HU-211
- CP 47,497 (and related chemicals)
- JWH-018
- JWH-073
Origins of Synthetic Cannabinoids

- HU-210 & HU-211 - synthesized at Hebrew University, Israel in 1988. HU-210 is an anti-inflammatory; HU-211 as an anesthetic
- CP 47,497 - developed by Pfizer in 1980 as an analgesic
- JWH-018 & JWH-073 - synthesize by a researcher at Clemson (1995) for use in THC receptor research - John W. Huffman
- more than 100 different synthetic cannabinoids have been created
Synthetic Cannabinoids Timeline:

- first appearance on the Internet 2004
- Europe was original target market
- by 2008 widespread in Europe
- 2008 introduced into US
- widespread in US by late 2008 - 2009
- late 2008 University Hospital Freiburg, Germany first analysis of incense
- first email Spring 2009
Pharmacological Effects of Synthetic Cannabinoids

- HU-210
- CP 47,497
- JWH-018
- JWH-073

- All act as THC agonists
An agonist is a chemical that binds to a receptor and triggers a response – often mimicking the action of a naturally occurring substance.
Smoking Cannabinoids

What does CB₁ receptor control?

- BG: motor control, learning
- Hippo: memory, spatial navigation
- CB: cognitive functions - attention, language, emotions
Pharmacological Effects of Synthetic Cannabinoids are Similar to THC

- increase heart rate & blood pressure
- altered state of consciousness
- mild euphoria and relaxation
- perceptual alterations (time distortion)
- intensification of sensory experiences
- pronounced cognitive effects
- impaired short-term memory
- reduction in motor skill acuity
- increase in reaction times
Dependence Syndrome Similar to Marijuana
Reported Effects of Synthetic Cannabinoids are Different to THC

- production inconsistencies
- herbal incense blends are harsher to inhale
- effect on appetite is non-existent
- increased restlessness & aggressive behavior
- herbal incense produces a shorter “high” (perceptual alterations & sensory effects are limited)
- doesn’t mix well with alcohol (hangovers)
- incense costs more than marijuana
What’s the legal status of synthetic cannabinoids?
Legal Status of Synthetic Cannabinoids (DEA)

- HU-210 - because it is structurally similar to THC, Schedule 1 controlled substance
- HU-211, CP 47,497, JWH-018 and JWH-073 - not currently controlled under the CSA
Countries That Have Banned Synthetic Cannabinoids:

- Austria
- Belarus
- France
- Germany
- Ireland
- Latvia
- Poland
- South Korea
- Sweden
- Estonia
- Romania
- Russia
- United Kingdom
USA Laws & Synthetic Cannabinoids:

- Oklahoma
- Kansas
- Kentucky
- Tennessee
- Georgia
- Louisiana
- Missouri
- U.S. Military
- Alabama
- Mississippi
- Illinois
- Arkansas
- Michigan
- Oregon
- New York
- North Dakota
- New Jersey
- Florida
- Indiana
- Ohio
Prevalence of Synthetic THC?

- no national statistics
- Louisiana:
  - 9 clients “pre-selected” based upon suspicion
  - 7 tested positive
- Columbia MO:
  - 17 clients “pre-selected” based upon suspicion
  - 12 tested positive
  - 5 self-admissions
National Statistics for Synthetic THC

- American Association of Poison Control Centers has reported:
  - All of 2009
    - 13 cases
  - First half of 2010
    - 567 cases in 41 states
    - 4000% increase
Can synthetic THC chemicals be detected by drug testing?
Drug Testing:

- NO on-site, rapid, instant tests
- NO laboratory-based screening tests
- Five laboratories employing LC/MS/MS technology
- mostly urine testing (one - oral fluid)
- $20 - $60 per sample
- many unknowns regarding this testing
Five Laboratories Are:

- Redwood Toxicology Laboratory
  Santa Rosa, CA
- National Medical Services
  Willow Grove, PA
- MedTox Scientific
  St. Paul, MN
- NorChem
  Flagstaff, AZ
- Sterling Reference Laboratories
  Tacoma, WA
The Wild, Wild West (Issues of Concern):

- What synthetic compounds (or metabolites) are being tested by these laboratories?
- no standardized urine cutoff levels
- no standardized methods (LC/MS/MS)
- no independent quality control materials
- no proficiency testing
- detection window unknown
- caveat emptor!
Are There Control Strategies Other Than Testing?
Alternative Control Strategies:

- community supervision

- search & seizure (client contract)
  - car, home, possessions
Court’s Response:

- place specific synthetic cannabinoid prohibition in your client contract
- establish a date certain testing date - inform client population
- establish sanction severity
- select participants for testing where there are indications of herbal incense use
- identify positive participants in court & sanction openly to enhance deterrent effect
- provide opportunity for participants to self-report
Designer Drugs:

- brings me no joy to alert you of this trend
- designer drugs are here to stay
- evolutionary patterns
- testing will lag behind
- legal controls will be difficult
- build community supervision/expand search & seizure efforts
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