

# Synthetic Cannabinoid Abuse in Adolescents & Young Adults



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# Missouri K2 Administration Study

## Bob Welsh, PI

- Missouri K2 Administration Study
- IRB Human subjects approval obtained from University of Central Missouri.
- Six subjects smoked K2 Summit, Citron, Standard
- Each contained JWH-018 and JWH-073, or CP47,497
- Subjects performed Standardized Field Sobriety Tests (SFST), cognitive tests and Drug Recognition Expert (DRE) Exam.
- Blood, urine and oral fluid collected.





# Missouri K2 Administration Study II

- **Onset of effects in about 2-3 minutes**
  - ❑ Dry mouth
  - ❑ Light headedness
  - ❑ Blurred vision
  - ❑ Agitation, Motor restlessness
  - ❑ Time dilation
- **DRE Exam**
  - ❑ Increased pulse and blood pressure
  - ❑ Lack of convergence
  - ❑ No horizontal or vertical gaze nystagmus
  - ❑ Pupils normal, muscle tone normal
- **FST's**
  - ❑ 3-4 inches of sway, leg body tremors
  - ❑ Loss of balance
  - ❑ Loss of motor coordination<sup>Draft</sup>



# Missouri K2 Administration Study III

Self reported effects:

- Tachycardia (increased heart rate, 5-30mm/Hg)
- Dry Mouth
- Felt Impaired, subjective thought disruption
- Changes in perception
- Impaired sense of time
- Mild anxiety, paranoia
- Sedation
- Post-intoxication exhaustion



## On Line forums--Physical Effects

- A number of users experience hangover-like effects the morning after use including dry mouth, intense headaches.
- Depending on the product, inhaled smoke is as harsh as marijuana smoke:
  - ❑ Taste can vary from a very bad to very sweet taste
  - ❑ One user described the taste as “sickly sweet”
- Conjunctival injection
- Increased appetite (“munchies”)
- Photosensitivity
- A warm sensation in the limbs
- Dry eyes
- Light headedness
- Painless head pressure
- Impaired coordination
- Sleeplessness



# On Line forums- Psychoactive Effects

- Marijuana-like effects:
  - ❑ Euphoria
  - ❑ Giddiness
  - ❑ Silliness
  - ❑ Impaired short-term memory and concentration
- Other common effects:
  - ❑ Paranoia
  - ❑ Auditory and visual hallucinations
  - ❑ Time distortion
  - ❑ Panic attacks
  - ❑ Delirium
  - ❑ Agitation



# Synthetic Cannabinoid Abuse: A Case Series of Adolescents

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# Synthetic Cannabinoid Abuse: A Case Series of Adolescents

➤ **Purpose:**

Synthetic cannabinoid products have been increasingly abused by adolescents over the past few years but little literature exists describing their psychoactive and physical effects. This study describes the psychoactive and physical effects of synthetic cannabinoids as reported by adolescent abusers.

➤ **Methods:**

This study reviewed the records of 11 persons 15-19 years who were evaluated at the South Miami Hospital Addiction Treatment Center in Miami-Dade County, Florida. The charts of youth who admitted to synthetic cannabinoid abuse were reviewed for demographic information, characteristics of the substance and psychoactive and physical effects.

➤ **Results:**

All of the subjects reported a feeling of euphoria and memory changes. Eighty-two percent reported other negative mood changes. Marijuana and alcohol use was also reported by ten (91%) of the subjects. The number of other drugs used was significantly correlated with the duration of synthetic cannabinoid abuse ( $r = 0.038$ ,  $p < 0.05$ ).

➤ **Conclusions:**

Adolescent synthetic cannabinoid product users report significant psychoactive effects.



# Synthetic Cannabinoid Abuse: A Case Series of Adolescents

- The average age of the subjects was 17.3 years ; 91% were male and Hispanic. Nearly 2/3 were attending high school .
- All of the subjects reported that the route of use was smoking.
- Seventy three percent (n=8) admitted to using these products more than three times lifetime, while half of this group (n=4) admitted to smoking these products multiple times per day.
- The frequency of synthetic cannabinoid abuse was significantly correlated with the educational level of the subjects ( $r = 0.00$ ,  $p < 0.01$ ) but not with the age ( $r = 0.553$ ,  $p = 0.78$ ).
- Eight (73%) of the subjects admitted to smoking synthetic cannabinoid products for 1- 12 months prior to their evaluation.
- The great majority (82%) of users admitted to purchasing the product in a retail shop. None reported purchasing these products over the internet



## Physical signs of acute intoxication from synthetic cannabinoids

- Gastrointestinal: Nausea, vomiting
- Appetite changes
- Conjunctival injection / Red eyes
- Tremors
- Numbness
- Dry mouth
- Paleness of skin
- Listlessness / Lack of interest
- Sweating
- Tachycardia
- Increased blood pressure



## Psychoactive signs of acute intoxication from synthetic cannabinoids

- Mood changes:
  - Euphoria
  - Anxiety
  - Irritability
  - Depression
- Cognitive changes:
  - Impaired short term memory
  - Confusion
  - Cognitive dulling
  - Impairment of linear thinking
- Changes in activity:
  - Sedation
  - Excitability
  - Agitation
- Sleep Changes
- Psychosis:
  - Disorganized thinking
  - Paranoid delusions
  - Auditory and visual hallucinations



## How is the Diagnosis made?

### *Clinical*

- In office based settings, a diagnosis of synthetic cannabinoid product abuse is supported primarily by the clinical history rather than presentation or mental status examination.
- The duration of the intoxication or “high” secondary to SCPs is relatively short (30 minutes or less). Subsequently, patients typically do not present acutely intoxicated to an outpatient office visit.
- Unlike marijuana, synthetic cannabinoids do not have a typical or “signature” smell.
- It is therefore less likely a physician will observe the psychoactive effects such as euphoria, anxiety, memory changes, confusion, agitation or physical effects such as tachycardia, nausea, vomiting, and hypertension.
- The mental status exam is useful in confirming some of the more persistent symptoms, including, physical effects such as, fatigue and conjunctival injection and psychotic symptoms.



## How is the Diagnosis made?

### *Clinical....*

- Physicians working in an emergency department setting are evaluating and treating an increasing number of patients acutely intoxicated with synthetic cannabinoids.
- Acutely intoxicated or “high” individuals exhibit many of the typical psychoactive and physical effects described above.



## How is the Diagnosis made?

### *Laboratory*

- Beginning in 2011 several laboratories began offering urine screening for SCPs.
- Only Redwood Toxicology Laboratory offers an oral fluid/saliva based method in addition to the urine testing.
- The expansion of available laboratories that offer this testing has been useful to clinicians but remain limited in their scope.
- SCPs have been shown to be sprayed with several different synthetic cannabinoids and the manufacturers of these products are constantly changing the psychoactive ingredients to circumvent existing laws.
- Most of these laboratories only check for the two most commonly found compounds though.
- Therefore, a positive toxicology finding is useful in affirming the diagnosis but a negative result does not rule out the possibility of synthetic cannabinoid abuse.
- Laboratory testing should be used in conjunction with a thorough clinical history and mental status interview to make the diagnosis



## 'Incense' makers thwart bid to weed out fake pot

By Jerome Burdi

The Miami Herald Posted on Sunday, Jun. 26, 2011

- The synthetic marijuana that federal authorities banned months ago is back, being sold legally in a different form in shops and on the Internet.
- Manufacturers have changed the chemical compounds just enough to skirt the ban by the U.S. Drug Enforcement Administration and a new Florida law, authorities said.
- Mr. Nice Guy, once one of the main brands of the “incense” that authorities targeted, is no longer sold. But on its website, the manufacturer promotes the brand Barely Legal, announcing it is “Legal in all 50 states.”
- Local police say Barely Legal is one of the new generation of synthetic marijuana products formulated to beat the ban.....
- Lantana police Officer Nelson Berrios, a member of the Palm Beach County Substance Awareness Coalition, said he saw two of the new products, Barely Legal and Fairly Legal, showing up in shops shortly after the federal ban was imposed in March. He alerted the Florida Department of Law Enforcement.
- When questioned, a store clerk produced a letter from a Raleigh, N.C., laboratory stating that the new products do not contain the five banned chemicals, he said.
- “There’s nothing that can be done about it because they’re currently legal,” Berrios said. “It’s a money issue at this point. People have become greedy. . . . It’s kind of difficult to say you don’t know what it’s used for when it’s called ‘potpourri.’ ”.....



# Detection

- Redwood Toxicology Laboratory. Available at: <http://www.redwoodtoxicology.com>.
- Bendiner and Schlesinger, Inc. Available at: <http://www.bendinerlab.com/index.htm>.
- Dominion Diagnostics. Available at: [www.dominiondiagnostics.com](http://www.dominiondiagnostics.com).
- ExperTox: Available at: <http://www.expertox.com/html/resources/protocols.php>.
- MEDTOX Diagnostics Inc. Available at: <http://www.medtox.com/resources/images/5883.pdf>.
- NMS Labs. Available at: <http://www.nmslabs.com>.
- Oracle Diagnostic Laboratories. Available at: <http://www.oraclediagnostic.com>.
- Quest Diagnostics. Available at: <http://www.questdiagnostics.com/hcp/testmenu/jsp/showTestMenu.jsp?fn=18961.html&labCode=MET>.



## Index of suspicion

- Patient has history of cannabis abuse.
- Patient has signs and symptoms consistent with cannabis abuse but routine urine toxicology is negative.
- Patient is in situation where urine is being monitored; such as, youth being monitored by parents or military personnel returning from leave.



# Interventions

- A scarcity of literature exists that addresses treatment interventions for SCP abuse.
- Interventions are in essence similar to those for marijuana abuse and dependency.
- Behavioral interventions, including cognitive-behavioral therapy and contingency based behavioral interventions (i.e., incentivizing and reinforcing abstinence), should be first line treatments.
- No medications are currently available to treat synthetic cannabinoid abuse.
- If comorbid psychoactive substance use disorders are present, treatment of the comorbid condition is also implemented.



# Summary

- Any teenager or young adult who you suspect to be using marijuana but has a negative tox screen, investigate for synthetic cannabis abuse
- Diagnosis is made:
  - ❑ Need to have a high index of suspicion
  - ❑ Clinical presentation and history
  - ❑ Self disclosure
  - ❑ ? Role of toxicology



# Parting Thoughts



“The soul is healed by being with children.”  
Fyodor Dostoevsky

“Real knowledge is to know the extent of one's ignorance.”  
Confucius

