

**A Snapshot of Synthetic Substances:
Nursing Implications for Patients
Suspected of Psychoactive Drug
Use®**

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Learning Objectives

- Define synthetic substances and their mechanism of action.
 - ★ Specifically focusing on synthetic cannabinoids
- Interpret psychological and physiological clinical presentation of patients after use of synthetic substances.

Magnet Components

- New Knowledge
- Exemplary Practice

Teen Dies In Coma After Smoking Synthetic Marijuana Problem

The parents of 18-year-old Connor Eckhardt hope to warn others about the dangers of synthetic pot.

Last month, a 18-year-old teen in California slipped into a coma and passed away after smoking synthetic marijuana, and now his parents want to warn others in order to prevent similar deaths in the future.

On July 11, Connor Eckhardt smoked synthetic weed with his friends. Soon after smoking the drug, he fell into a coma with brain swelling. "In a moment of peer pressure, he gave into that thinking that was OK, it was sometimes safe, and one bit later, he goes to sleep and never wakes up," said Connor's father Devin Eckhardt.




Teenage girl left brain damaged and paralyzed after smoking synthetic marijuana


Parents Appear to Be Horrified by the Death of Their Son, 18, who Died After Smoking Synthetic Marijuana

Family warns teens to steer clear of synthetic drug Spice as they mourn dead son

The synthetic cannabinoid is said to be behind the death of a teenager in Alaska, who used the drug sometimes with his usual manufacturer of Spice. The synthetic cannabinoid is reportedly, which was agreed with drug parent material and packaged as a form of medicine or smoking in a light that deadly substance to marijuana.

DAILY NEWS

What have been your experiences?

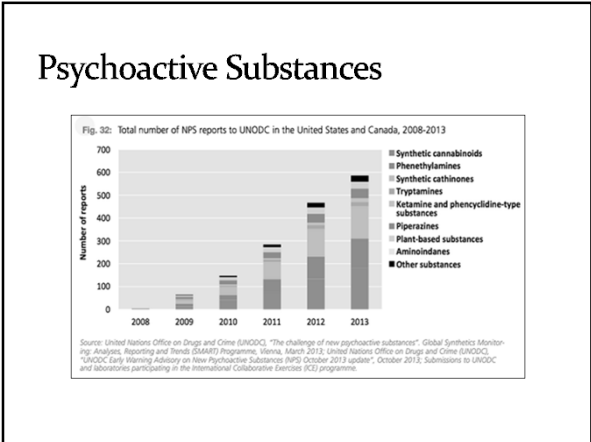


Exemplar Case

- Dec. 2012, 16-year-old Female, smoked, "Kush" sold in a gas station as potpourri, "not for human consumption".
- Within 15 minutes she told her boyfriend she had a "migraine" & went to lie down.
- After only a short period, she appeared to be in a "psychotic state", urinating on herself, running herself into walls, hallucinating, & violent behavior.
- Police were called she was taken to local ED and placed into an induced coma & spent 4 days in the ICU

- The doctors determined she had a severe cerebral stroke with associated vasculitis.
 - ICP was 28 mm HG
 - Sent to OR for EVD to relieve pressure on her brain
- Jan. 2013, was removed from the ventilator and feeding tube removed (expected to pass w/in 30 minutes)
- Patient survived!
- Currently, is blind, bound to a wheelchair, with permanent brain damage.
-<http://ireport.cnn.com/docs/DOC-895582>

- Video will be here

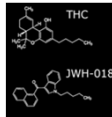


Different chemicals, but patient presentation similar

- Present to the ED primarily with manifestations of:
 - Severe agitation and paranoia
 - Tachycardia & palpitations
 - Negative toxicology screen
 - No other pathology to describe signs and symptoms

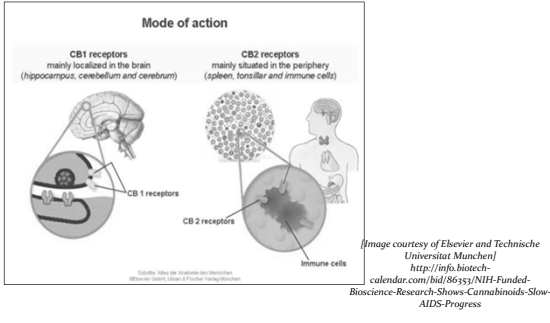
What are Synthetic Cannabinoids?

- Herbal “incense” products sprayed with synthetically produced cannabinoids
 - Chemicals (of unknown composition or amount) sprayed on plant materials or unknown content
 - Chemicals that mimic the actions or have a similar structure to delta-9-tetrahydrocannabinol (Δ^9 -THC)
 - Effects “supposed to be” similar to the psychoactive properties of marijuana or delta-9-tetrahydrocannabinol (Δ^9 -THC)
 - “Catchy” names and “attractive” labeling

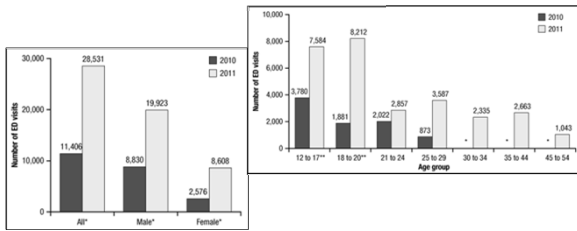




Mechanism of Action: Endocannabinoid System

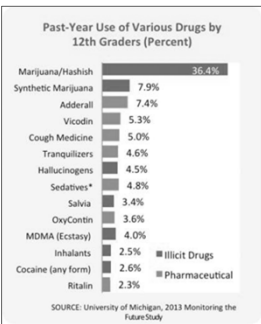


Who are primary users?



SAMHSA Drug Abuse Warning Network
The DAWN Report

Incidence of Use



- The use of synthetic cannabinoids dropped from the 2012 level of 11.3% among 12th graders
- A majority of teen users of SCs also use regular THC

Legal Implications

- Federal Analog Act (1986)
 - Comprehensive Drug Abuse Prevention & Control Act (1970)
- Synthetic Drug Abuse Prevention Act (July, 2012)
 - (S. Res. S. 3190, 2012)
 - 15 cannabimimetic agents (CB₁ receptor agonist) became Schedule I substances
- 2013 Drug Enforcement Administration (DEA) temporarily banned 3 additional substances (UR-144, XLR11, AKB48)
- Feb., 2014 DEA temporarily banned another 4 substances after 221 individuals became ill



Toxicology

- Synthetic Cannabinoids not detected on regular toxicology screen
 - JWH-018/073 first to be tested in 2010
 - Forensic testing
 - Point of care testing now available
 - Primarily for JWH-018/073

Syn_Can_Graph.pdf

SYNTHETIC CANNABINOIDS TESTING IN ORAL FLUID
NEW! - Qualitative screen in oral fluid
 AM-2201, AM-694, JWH-018, JWH-019, JWH-073, JWH-081, JWH-122, JWH-250, JWH-215, JWH-265, RCS-4, RCS-8 (benzocaine, carboxinates)

SYNTHETIC CANNABINOIDS TESTING IN BLOOD
Fast new technique 20' turnaround!
 A-79296, AM-1246, AM-2201, AM-2233, AM-694, JWH-018 8-metabolite, JWH-018, JWH-019, JWH-022, JWH-073, JWH-081, JWH-122, JWH-250, JWH-265, JWH-215, JWH-265, RCS-4, RCS-8, UR-144, XLR-11

SYNTHETIC CANNABINOIDS TESTING IN URINE
Scope of our Synthetic Cannabinoid Metabolite Screen, Expanded now includes 23 metabolites!
 AM-2201, JWH-018, JWH-019, JWH-022, JWH-073, JWH-081, JWH-122, JWH-215, JWH-250, RCS-4, UR-144, XLR-11, BB-22, PB-22 and BAM-2201 metabolites (screened by LC-MS/MS, confirmed by GC-MS/MS)
 JWH-018, JWH-073 and UR-144 / XLR-11 metabolites (screened by ELISA, confirmed by LC-MS/MS)
 PB-22, BB-22 and BAM-2201 metabolites - NEW! (screened and confirmed by LC-MS/MS)

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Clinical Manifestations

Psychological

- Delusions
- Hallucinations
- Anxiety**
- Paranoia**
- Agitation
- Seizures
- Dystonia
- Tremors

Physiological

- Nausea
- Vomiting
- Palpitations**
- Tachycardia**
- Diaphoresis
- Dyspnea

** Most pronounced manifestations

Significant Effects

- Stroke
- Renal failure
- Death



Synthetic Marijuana Suspected in 3 Deaths, 75 Hospitalizations in Colorado

Synthetic marijuana may be to blame in three deaths and 75 hospitalizations in Colorado, CHS reports. The Colorado Department of Health and the Centers for Disease Control and Prevention are investigating whether the drugs caused the illnesses, which sent people to hospitals in Denver and Colorado Springs beginning in late August.

Synthetic marijuana, commonly known as K2 or Spice, is a mixture of herbs, spices or shredded plant material that is typically sprayed with a synthetic compound chemically similar to THC, the psychoactive ingredient in marijuana. It is typically sold in small, white plastic bags of dried leaves and marketed as incense that can be smoked.



Case Study 1-paranoia

- June, 2011, 19-year-old Male, smoked "iAroma" purchased at a tobacco shop in the mall.
- He arrived home and after his friend left he phoned his brother and said, "I smoked that legal stuff and I'm freaking out."
- 30-minutes later he got into his car and drove through town at speeds between 80-100 mph.
- When the road came to the end.....he never braked.

Case Study 1 cont.

- His car went 80 feet through the air & landed in a house and he was pronounced dead at the scene.



- He had NEVER used illicit drugs or smoked synthetic cannabinoids before!

-<http://www.tothemaximus.org/>

Case Study 2-psychosis

- 26 year old male, post-graduate student with no prior mental health history except for ADHD.
- Smoked "Black Diamond" and moments afterwards he became paranoid with delusions. He felt "his hands were going to harm him"
- He placed both hands on the stove (turned on) and as he stated he "attempted to burn them off to get the devil out of him"
- Upon arrival of emergency and fire personnel it took 6 fire fighters and a taser to get him to release his hands from the stove.

Meijer, K.A., et al. (2014)

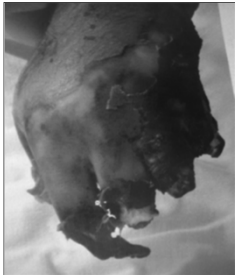


Figure 1: Initial emergency department photograph of the dorsum of the left hand.



Figure 2: Initial emergency department photograph of the volar surface of the left hand.

Management

- Very difficult to get a detailed history from patient
 - Important to try to determine time, route, & intent of use (recreational vs. suicidal)
 - Prior mental health history
 - Prior substance abuse history
- You may need to elicit the history from family or friends, however, you may not be able to obtain this information and will need to rely on physiological and psychological manifestations.

Management

- No antidote!
- Supportive Management
 - Airway, breathing, circulation*
 - Monitor vital signs, ECG, labs to assess acid/base balance & renal function (urine toxicology screen maybe unhelpful)
- Benzodiazepines for severe anxiety—first line agent
- IV fluids-if dehydration or hyperthermia present
- If hyperthermic (poorer outcomes—MODS) may need cooling blanket to decrease risk of rhabdomyolysis

Management

- Patient & Parental education
 - Synthetic cannabinoids (like all synthetics) have may different names
 - Labeled as potpourri, incense, or tobacco
 - SCs are dangerous, much more so than THC
 - Each individual responds differently each time used
 - SCs are easy to find and purchase
 - Internet, gas stations, or head shops
 - May not show up on regular toxicology screening

Summary

- Despite widespread media coverage, many healthcare providers remain unfamiliar with synthetic drugs such as synthetic cannabinoids (Spice) or cathinones (bath salts).
- Research is needed to better understand the side effects and long-term consequences associated with the use of synthetics.
- Increase availability of toxicological identification of substances is needed along with blanket legislation to curtail creation and distribution of changing synthetic analogues.

Questions

- Thank you for your time and attention
- Spread the word and be alert!
 - *“The newest compounds on the street are chemically different than the first generation compounds. They are potent, impairing, and addictive!!”*
~B. Logan
- Contact information:
 - tracy.brewer@wright.edu
 - margiestone@hotmail.com

References

- Brewer, T.L. & Collins, M. (2014). A review of clinical manifestations in adolescent and young adults after use of synthetic cannabinoids. *Journal for Specialists in Pediatric Nursing, 19*, 119-126. doi: 10.1111/jspn.12057
- Meijer, K.A., Russo, R.R., & Adhvaryu, D.V. (2014). Smoking synthetic marijuana leads to self-mutilation requiring bilateral amputations. *Orthopedics, 37*(4), e391-e394.
- <http://www.samhsa.gov/data/DAWN.aspx>
- NMS Labs. www.nmslabs.com
- <http://www.tothemaximus.org/>
- Detailed reference list upon request
