Many of us have heard of K2, misleadingly labeled as “synthetic marijuana,” but are unaware of what a significant problem this product has become in our communities. Synthetic Cannabinoid Products (SCPs) include “K2,” “Spice,” “Genie,” Blaze,” and “Dream” among other terms. These products are marketed as herbal incense but when smoked they produce psychoactive effects that are often similar to marijuana.1 They can also be injected, inhaled from pipes, drunk as a tea, or rolled in joints. SCPs are easy to obtain using the internet and are also available for purchase at retail outlets and some gas stations; they are usually sold in small, silvery bags of dried leaves.2

How do Synthetic Cannabinoid Products work?

The active constituent of marijuana is ∆⁹-tetra-hydrocannabinol (∆⁹-THC), which exerts its psychological effects by interacting with the cannabinoid receptors (CB1 and CB2) in the brain.3 Since the cannabinoid receptors were discovered, researchers have started to synthesize a variety of chemical compounds that modulate these receptors and have discovered JWH-018, the most common compound used SCPs.

What’s the problem with Synthetic Cannabinoid Products?

Most users of K2 and other SCPs assume that a marijuana-like drug will cause a marijuana-like high. According to users, medical professionals and law enforcement officials, however, the effects of SCPs are much more potent than those of traditional THC marijuana and many of their effects are the opposite of what would be expected with a traditional marijuana high. According to users of SCPs, its most prominent effects include anxiety, paranoia and even “psychotic” feelings.4 It is likely that SCPs such as JWH-018 can precipitate psychosis in those with psychiatric risk factors.5

Emergency rooms across the state are seeing increasing numbers of SCP users who present with very severe agitation, dangerously elevated heart rates, panic and anxiety attacks, disorientation and significant hallucinations. The stimulant effects of SCPs like K2 stand in contrast to the mellowing effect that users seek in a synthetic marijuana product. According to Stacey Bangh, PharmD, Clinical Supervisor at the

Minnesota Poison Control Center\(^6\), “we have seen a lot of patients having the opposite effects as marijuana when they present to the ER: agitated, tachycardic, several with seizures.” According to Dr. Bangh, their treatment often requires “benzos and time, as well as keeping them safe.”

Poison control centers across the nation are seeing a sharp increase in the number of emergency calls related to K2. As an example, 2,915 calls were made to the two major poison control centers (AAPCC and NPDS) in 2010. As of September 30, 2011, over 5,000 calls were made to the poison centers, confirming that the frightening effects of K2 are escalating across the country.

The use of SCPs including K2 is well-established in Minnesota. The Minnesota Poison Control Center saw an increase from 28 exposures in the year 2010 to 116 through mid-October of 2011.\(^7\) Although it is not surprising that Hennepin County had the greatest number of exposures reported to the Minnesota Poison Control Center in 2009-2011 (25 exposures), St. Louis County’s second-place rank (13 exposures) ahead of even Ramsey County (12 exposures) is noteworthy.

Law enforcement officials across the state are quite familiar with K2 and its unpredictable effects. Adam Wright, Narcotics Officer for the Boundary Waters Drug Task Force in Northeastern Minnesota, believes that the effects of K2 are “worse than that of regular THC marijuana.” According to Officer Wright, “People that we deal with are almost in a hallucinational phase. The effects are certainly that of THC marijuana but it appears that the euphoric stages are much worse.” Duluth Community Policing Officer Rob Hakala describes being on two calls where K2 users were hallucinating: “One was a woman who was attacking cars as she felt they were the reason she could not find her house. Second was a woman who cut off all of her hair to get the 'bugs' out. Not known if the K2 was mixed with other drugs on this call but both were using K2 prior to the incidents.”

Although the SCBs K2 and Spice (JWH-018 and related compounds) have been banned in other parts of the world, they remained uncontrolled at the federal level in the United States until March 1, 2011 when the DEA used its emergency scheduling power to schedule five synthetic cannabinoids (JWH-018, JWH-073, CP-47, 497, JWH-200 and cannabicyclohexanol) in the schedule 1 list of controlled substances.

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\(^6\) Bangh, Stacey, PharmD, DABAT, Clinical Supervisor at The Minnesota Poison Control Center. Interview on October 28, 2011.

\(^7\) Bangh, Stacey, PharmD, DABAT, Clinical Supervisor at The Minnesota Poison Control Center. Interview on October 28, 2011.
**Who is using synthetic cannabinoid products?**

K2 is an emerging drug of abuse in people of all ages, but especially young persons, because of the ease of use in which it is obtained over the internet: “There are an increasing number of websites where users can order Spice blends or pure JWH compounds without age restriction or any type of control.”⁸ Studies have shown that K2 has been used by nearly one in ten college students; it was “particularly common among males and early college students.”⁹ According to law enforcement officials in St. Louis county, synthetic cannabinoids are being used by individuals who normally would not experiment with street drugs.

**How can we test for synthetic cannabinoid use?**

Much of the popularity of synthetic cannabinoids comes from the fact that their use is not detectable in standard toxicology tests, thus allowing SCP users to escape detection.¹⁰ A new method of testing for SCB metabolites in urine using liquid chromatography-tandem mass spectrometry (LC-MS-MS) has been developed and validated. This method, which has “high sensitivity and reproducibility,” may gain popularity in the analysis of forensic urine specimens for the detection of K2 abuse.¹¹ Another LC-MS-MS method has been developed to test whole blood samples for SCB’s including JWH-018, JWH-073, JWH-019 and JWH-250.¹²

The composition of synthetic cannabinoid products is changed repeatedly over time “as a reaction to prohibition and prosecution of resellers” and because of this, “neither the reseller nor the consumer of these mixtures can predict the actual content of the ‘incense’ products.”¹³ As long as there is no generic definitions in the controlled substances legislation, “further designer cannabinoids will appear on the market as soon as the next legal step has been taken.”¹⁴ As new cannabinoids will continue to appear in the future, a continuous monitoring of these products is required.

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What are the psychoactive effects of Synthetic Cannabinoid Products?

- Euphoria
- Memory changes
- Irritability
- Anxiety
- Visual perception changes
- Auditory perception changes
- Paranoid thoughts

What are the physical effects of Synthetic Cannabinoid Products?

- Seizures
- Tachycardia
- Palpitations
- Appetite changes
- Blackouts
- Restlessness

Resources:

Minnesota Poison Control Center Hotline: 1-800-222-1222
Open 24 hours, 7 days a week

Poison emergency and information calls are answered by nationally Certified Specialists in the Poison Information (CSPI). They answer poison related questions and provide first aid advice and treatment recommendations to the general public and health care professionals throughout the state. The service is provided via a national toll-free telephone number accessible by both voice and TTY and is available 24 hours a day, 365 days a year. Interpretive services are also available in most languages.

National Drug and Alcohol Treatment Referral Routing Service: 1-800-662-HELP
Open 24 hours, 7 days a week

This service will provide free information & treatment referral assistance for alcohol and substance abuse, as well as mental health. It is provided by the U.S. Department of Health and Human Services Substance Abuse and Mental Health Services.
Laura Palombi is a PDIV student at the University of Minnesota – College of Pharmacy in Duluth. She is currently on rotation at St. Luke’s Hospital in Duluth.