



MEDTOX[®] Journal

Public Safety Substance Abuse Newsletter

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K2: A One-hit Wonder or a Real Cannabis Alternative?



Newsletter readers are probably getting a bit fatigued by the sudden proliferation of designer "alternative" drugs of abuse. Cloaked in incense or herbs, these new age drugs appear to have been dug up by marijuana scholars who have scoured research logs of scientists who have worked on the development of synthetic cannabinoids. The latest compound to splash on the scene is a substance known cryptically as JWH-018. This substance was the discovery of Dr. John Huffman, a Clemson University professor who supervised its development as part of a broader research project involving the study of endogenous cannabinoid receptors. JWH-018 was a substance that had specific binding or agonist actions at those receptor sites. The drug is a synthetic compound that has an official chemical designation of *1-Pentyl-3-(1-Naphthoyl)Indole*. Its name on the street,

at least for now, is K2.

At the present time, JWH-018 is being synthesized overseas. In a liquid form, JWH-018 is sprayed over plant material destined for packaging as incense or room deodorant. The treated botanicals are then packaged and labeled as K2. The product is widely available over the Internet and is available in varying weights, strengths, and colors. Some head shops in the U.S. are selling the product over the counter, in the same manner as *salvia divinorum* is. At the moment though, the Internet is the principle market for sales and distribution of the substance. It is clear that K2 has a fan club consisting mostly of long time marijuana users. A number of blogs devoted to marijuana smoking and marijuana legalization contain testimonials from K2 and JWH-018 smokers. Thought to be 4 to 5 times more powerful than THC, the prime intoxicant in marijuana, JWH-018 causes what appears to be a unique set of effects on the central nervous system. The K2 incense is smoked and appears to have near instant sedative effects on the user. This stands in stark contrast to the effects of traditional smoked marijuana, wherein the THC high sometimes takes 15 to 20 minutes to take hold. The differences between the organic and the synthetic may lie in the fact that THC is transformed into a more psychoactive metabolite once it enters the bloodstream. It appears that JWH-018 is not manipulated and made more active by way of metabolism; it is instantly active as a cannabinoid receptor(s) agonist.

There is a lack of reliable scientific information relating to JWH-018. That limits any broad assessment of it as a drug of abuse that is capable of causing physical dependency. Chronic marijuana use can lead to addiction and physical dependency. Early reports of JWH-018's effects suggest that not all of the high is pleasurable. Some testimonials point to agitation, confusion, and dysphoria that persisted for an hour or more following the smoking of JWH-018 perfused incense. Others however are complimentary of JWH-018's hallucinogenic LSD-like effects. It remains to be seen if JWH-018 and K2 spice are a one-hit wonder or a phenomenon that will take hold to become the latest edition to the alternative drug scene.

February DARS Hotline Call: How Do I Know If My Client Is Abusing Soma?

In the past several months, the *DARS* and *ProtectMD* Hotline banks have received inquiries related to detection and documentation of Soma abuse. Soma is *carisoprodol*, a prescription medication mostly used as a skeletal muscle relaxant. Prior editions of this Newsletter have probed the growing phenomenon of Soma abuse. Soma is frequently combined with opiates (hydrocodone and oxycodone) to create an enhanced narcotic euphoria. It is also used in combination with stimulant drugs, such as methamphetamine, to bring about an antagonistic high called a "speed ball." Chronic use of Soma may lead to addiction and physical dependency. Soma abuse has grown to the point that public safety and healthcare providers are now seeking ways to test for it.



Soma is an interesting drug whose pharmacology was not well recognized until the mid-80s. Burgeoning demand for Soma on the street prompted law enforcement agencies to take a closer look at the drug's effects on the central nervous system. Following ingestion of Soma tablets, *carisoprodol* is metabolized to *meprobamate*.

Soma's sedative effects are the result of *meprobamate's* action at *GABA* receptors. *Meprobamate* is a well-known sedative and for decades has been used to treat various anxiety disorders and mitigate the effects of alcohol withdrawal. Soma's pleasurable effects are the direct result of its transformation into *meprobamate*. Although *meprobamate* has central effects that are similar to other sedatives, such as the *benzodiazepines* (Valium, etc.) and *barbiturates* (Phenobarbital), the drug is representative of a distinctly different class of chemicals. As such, drug tests for Soma necessitate the use of unique antibodies that are different from those used to test for Valium, Xanax, and other commonly abused sedatives.

Soma information and summaries of drug abuse experiences can be found all over the Internet. The drug is in high demand. It is clear that most Soma users understand and appreciate that the drug is rarely a component of modern drug test panels. As a result, the majority of Soma abuse goes undetected. Although there are no instant testing (point of collection) devices on the drug testing market today, lab-based testing for Soma is relatively easy to arrange. The levels of Soma abuse vary according to geography and demographics. Somewhat pricey, Soma abuse is has been more commonly found amongst middle income adult populations situated in densely populated urban areas. A random drug-testing program currently operating in a large Los Angeles area school district has revealed that teenagers now identify Soma as a drug worthy of purchase and experimentation. Soma is a welcome addition at adolescent "cabinet parties." Undertaking periodic screening for Soma abuse may be a wise move in populations and communities where the drug has surfaced and is available for purchase on the street.

More information about Soma (*carisoprodol*) abuse and the drug testing protocols for it may be obtained by contacting the DAR "online-hotline" at darsprogram@mac.com

Cocaine and Methamphetamine Abuse: Are There Differences in Their Long-term Effects on Mental Health?



Cocaine ("blow," "crack," and "rock") and methamphetamine ("crank," "speed," and "gak") are both powerful stimulants of the central nervous system. The drugs are noticeably different in the ways they stimulate the central nervous system. Cocaine brings about monoamine (i.e., dopamine, norepinephrine) transporter inhibition. Methamphetamine exerts its effects by triggering more direct monoamine release. Maybe the most important distinction between the two is their half-life. The half-life for cocaine is 90 minutes. Methamphetamine's half-life is 11 hours. The difference in half-lives significantly determines the course that these drugs follow during abuse. For professionals who work with cocaine and methamphetamine

abusing populations, there is a recognition that the psychosis that develops from chronic use of these drugs is different than that which occurs with any other drug. Recently, a UCLA study investigated the experiences of cocaine- and methamphetamine-dependent addicts and reported the qualitative differences that exist in the psychosis relative to each. The results were published in the *American Journal on Addictions*. [\[1\]](#)

The participants in the study included 42 non-treatment-seeking, cocaine-dependent patients and 43 non-treatment-seeking methamphetamine-dependent patients. Each patient met DSM-IV criteria for drug dependence. None of the participants were cross dependent. Participants were carefully recruited, assessed, and screened for the project. A variety of psychological inventories were used in the investigation. The investigation was so precise that researchers were able to qualitatively assess the drugs and determine how much each patient was taking every day and how much money each patient spent. The evaluation was comprehensive. A limitation of this study may have been that the various symptoms and experiences of psychosis were self-reported to research assistants; there were no live observations of psychotic symptoms by mental health professionals. Nevertheless, this investigation plowed into an area of substance abuse that significantly influences patients and their treatment providers throughout the course of detoxification and rehabilitation.

The results turned up some very interesting details about each of the two populations. Cocaine users had been using the drug significantly longer than the methamphetamine addicts; comparatively, cocaine addicts also used larger amounts of that drug. The groups were similar in age, ethnicity, and the preferred method of ingestion. The frequency of psychotic symptoms was very high for each group as well as some interesting differences. While abstinent for instance, methamphetamine-abusing men were more likely than cocaine users to report "seen or felt things that others could not." Methamphetamine-abusing men also reported higher rates of "someone or something has external control over their actions."

The study also evaluated male users experiences while high. Being high was defined as being actively engaged in seeking and using the drug. The methamphetamine abusers were more likely to claim that they were being conspired against by some vaguely identified organization or group. But on balance, the overall frequency levels of psychotic symptoms experienced by the cocaine-using group were equal to the methamphetamine-abusing group. Although comparisons of male using groups yielded even results, cocaine and methamphetamine-using females exhibited higher levels of paranoia whether they were abstinent or high. Frequent delusions identified by the female subjects included such things as "people are talking about you" or "feeling as if your significant other was engaging in acts of infidelity."

An interesting offshoot of this investigation revealed that there were no differences in the reporting of the most common psychotic symptoms between groups according to their methods of ingestion (smoke, inject, or snort). This discovery may be at odds with the experiences of some law enforcement and rehabilitation professionals who often assert that methamphetamine "smokers" exhibit more profound and longer lasting psychotic effects while they are engaged in active use of the drug. During DAR course sessions, students frequently point out that methamphetamine abusing men and women seem to experience more tactile hallucinations than cocaine users.

Further, the students point out that female methamphetamine addicts are much more likely to claim that they're infested with spiders or bugs than males using methamphetamine.

This well-constructed and thoroughly detailed study revealed that psychotic symptoms experienced by long-term methamphetamine and cocaine using men and women are very high, significantly higher than for other classic drugs of abuse such as alcohol, opiates, and marijuana. The rates and frequency of psychosis and paranoia may in reality be higher for both of these populations than what was characterized in this study. This investigation precluded the participation of patients with schizophrenia or non-drug related psychosis. Screening the participants may have eliminated a statistically relevant number of stimulant abusers who experience significant psychosis. Other notable research in this field conducted in 2006 has fixed the rate and frequency of psychotic symptoms for methamphetamine and cocaine abusers as even higher than the research summarized here.^[2]

This instant study nevertheless adds to the body of research and experience that tells us that the treatment of methamphetamine and cocaine addiction is very difficult and prone to setbacks and relapse. The long-term, persistent effects from CNS stimulant use are real and they must be taken head on.

The MEDTOX DAR program offers a special curriculum for our customers who work with caseloads or situations where methamphetamine abuse is a central problem. "Managing Methamphetamine" is available in four and eight hour formats. Readers who would like more information about attending this course or other seminars in the DAR lecture series should contact their regional sales representative at MEDTOX or contact the DAR team directly at darsprogram@mac.com.

[1] Mahoney, III, J, Kalechstein AD, De La Garza, II, R, Newton, TF. Presence and persistence of psychotic symptoms in cocaine-versus methamphetamine-dependent participants. *Am J Addict* 2008; 17:83-98.

[2] Mc Ketin R et. al, The prevalence of psychotic symptoms among methamphetamine users. *Addiction*. 2006; 101:1473-1478.

Are Teenagers Abusing Steroids? What Role Do Training Supplements Play?

Steroid abuse by teenagers is a real and valid concern. Anabolic steroids make up a fairly large group of drugs designed to simulate the androgenic effects of testosterone. For junior high and high school students, these drugs are sought because they catalyze the growth of muscle tissue. As a second order effect of steroids, users grow and hone their athletic skills and abilities. With dedicated training and weightlifting, boys get bigger, stronger, and more chiseled. Increased muscle mass is a force multiplier for athletes who compete in sports where muscle strength is an advantage. Steroids were once thought as being too complicated to understand and use, but kids are open to using them even when there's a lack of guidance on their use. Improper use of these drugs can lead to serious consequences that include adrenal collapse and serious harm to the endocrine system and liver. In an era of drug abuse dominated notoriously by harmful drugs such as methamphetamine and heroin, steroid abuse fails to generate as much concern or interest at school or at home.



The performance enhancing effects of anabolic steroids are fairly well chronicled. Expanding and compounding the impact of steroid abuse is the growing utilization of over-the-counter "supplements" used to spur muscle growth during athletic weight training. These expensive products can be found in nearly all vitamin and nutrition

stores. They are also widely available for purchase on the Internet. Nowadays, hundreds of different potions are available to the consumer. In the mid-90s, weight training supplements were made mostly of products that contained *creatine*, a nutrient that helps provide energy to muscle tissue. Creatine occurs naturally in the body. It is synthesized from several different amino acids. These types of supplements supplied weight lifters with extra stores of Creatine so that in times of physical demand, muscle tissue could perform, breakdown, and then repair itself more quickly and efficiently. Rather quickly, the nature and availability of this sort of "nutritional" substance has changed. At the moment, the market is awash with compounds that contain hidden steroids, designer steroids, and steroid precursors that mix into a potion with various vitamins and nutrients. Quite often these products fail to indicate that a form of chemical steroid is present. Because these products are not medicines, the FDA does not approve them for public use. However, these substances are legal to use and are viewed as less risky than steroids, they are instantly attractive to adolescents who are desirous of becoming bigger and faster athletes.

Results from a recent Pride Survey undertaken by International Survey Associates were discussed in a recent edition of the Journal of the American Medical Association (JAMA).^[1]

The JAMA article points out the concerns that pediatricians and other healthcare providers share about the use of steroids and supplements by adolescents. The Pride survey utilized an instrument that communicated with more than 120,000 U.S. students who were in grades 6-12 during the 2008-2009 school year. The results for steroid abuse are worrisome. Almost 2% of junior high students and 5% of high school students reported using steroids (<http://www.pridesurveys.com/customercenter/us08ns.pdf>). The survey established that steroids are predominately abused by boys. The high school cohort reported rates of male steroid use to be nearly 3:1 more than girls. This statistical disproportion underscores the impact that performance-enhancing drugs can have on boy's sports, contests where brute strength, speed, and endurance are core components for success.

With the admittance of performance enhancing drugs amongst professional athletes, kids interpret a mixed message. On one hand, the humiliation of a previously admired athlete who is forced to admit the lies of drug use is a powerful message in prevention. On the other hand, the fact that an athlete did in fact make it to the highest level of athletic accomplishment and the feat was achieved with little effect on the player's overall level of health; a youngster might then view risks of steroid abuse as not that serious. It certainly creates conditions where the use of special nutritional supplements might be more acceptable when considering how to become a better high school athlete.

Travis T. Tygart, JD, is the chief executive officer of the United States Anti-Doping Agency. This organization is responsible for preventing and investigating the use of performance enhancing drugs for athletes who participate in Olympic competitions. In September 2009, Dr. Tygart testified before a U.S. Senate committee where he commented, "the average designer steroid consumer of 2009 is not an elite athlete, but a broader population of people who want to be healthy and fit including young adult athletes; junior high and high school high school athletes; weekend athletes; and law enforcement, fire department and military personnel." Tygart's comments underscore the nature of the problem with steroids and related special growth supplements on adolescent and adult populations. The FDA has no jurisdiction and limited authorities in dealing with designer steroid supplements. To step in and take action, the FDA has to have solid evidence that a particular substance has unlabeled pharmaceutical ingredients in it. With all of the challenges that the FDA faces, investigation of suspicious training supplements is not a high priority. Nevertheless, the agency has taken a bold step forward by warning consumers to avoid taking supplements that purport to contain steroids or steroid precursors. The agency has allegedly received reports from men that developed a variety of serious medical problems following extended use of these questionable supplements.

Parents, counselors, and coaches alike have pivotal roles in supervising adolescents who participate in organized interscholastic and club sports. Drug testing for steroids requires special lab-based protocols; there are no instant drug screening devices that can test an athlete for steroid use. Adults can help to prevent the use of these drugs

and supplements by wielding a sharp eye. Adults can be on the lookout for the use of supplements and frequent, expensive purchases at nutrition shops. They can also read the ingredients on supplements that an adolescent may be taking, any reference to steroids or steroid precursors should be a cause for concern. Be sensitive to boys when they become secretive and evasive about excessive time spent at the gym or with older boys who are evident body builders. Steroids are typically trafficked in and around gyms and fitness clubs. In most communities, gym "rats" know who is dealing and where one needs to go to find steroids. Steroids are expensive and they need to be taken in a precise fashion. Be aware of terms such as "stacking," "cycles," and "juicing." These terms are all steroid nomenclature.

MEDTOX Drug Abuse Recognition (DAR) courses include a module of instruction on the topic of anabolic steroid abuse. The course teaches students to recognize and document the unique signs and symptoms of steroid abuse and misuse. Questions about steroid abuse can be directed to the DAR Team at MEDTOX. A member of the group can be contacted at the "online-hotline" at darsprogram@mac.com.

[1] Kuehn B, Teen steroid supplement use targeted, officials look to prevention and better oversight. *JAMA*. 302; 21: 2301-2303.

Name that Drug: *Who Would You Invite to a Cabinet Party?*



This month's mystery drug is no stranger to the American drug scene. Its ascendancy to a spot of widespread abuse is a relatively new development. This fact is a significant clue as to the identity of this month's mystery drug. This month's drug was brought forth out of worldwide concern associated with addiction involving rampant abuse of cocaine and heroin. At one point in the past, both of those drugs were touted as miracle cures for laundry lists of manifest disease and psychiatric illness. Many a scientist and medical researcher became addicted to one, if not both, of those drugs. Some scientists and medical researchers unwittingly addicted friends and spouses in their efforts to research and explore the drugs' effects. With the removal of heroin (diacetylmorphine) from prescription formularies, medicine needed to develop alternative narcotic-analgesics to fill the hole left behind. Since the institution of the Harrison Act of 1914, myriad drugs have been touted as therapies for the treatment of moderate to moderately severe pain.

This month's drug is one of those substances. Nearly 100 different analgesic medications have been introduced at one time or another into the American drug formula since the demise of heroin. Relatively few of them withstood the test of time as the list has been whittled down to what it is today. An equal mix of synthetic, semi-synthetic, and natural drugs comprise modern day narcotic-analgesics. This month's drug is a narcotic and it is semi-synthetic. *At this juncture we've eliminated the potential for heroin as this month's drug. Are there any nominations?*

This month's drug was the end product of efforts made to improve upon the then existing menu of narcotic analgesics. Originally conjured by German scientists in 1914, they extracted this drug from thebaine (paramorphine), a narcotic in its own right and minor alkaloid constituent of opium. Research indicated that this month's drug had potency that was nearly equal to morphine. The drug's action at the central *mu* opiate receptor is profound. In its base form, this month's drug can be considered one of the fastest acting opiates around. In fact, once absorbed into the bloodstream, this month's drug exerts its effects more quickly than heroin. A member of a family of opiates that are referred to as the *codeinones*, the drug displays a striking structural similarity to codeine. This drug possesses analgesic effects that are considerably greater than codeine. Like codeine, this drug can be found as a component of narcotic constituted cough syrups. The chemical signaling involved with

coughing is mediated by opiate receptors and powerful agonists like this drug can be very effective cough suppressant (antitussives).

This drug is available by prescription only. It is regulated by the DEA under the terms of the Controlled Substance Act, Schedule II. The drug is frequently compounded with other non-narcotic substances for enhanced pain relief. Tylenol (acetaminophen) and aspirin are routinely mixed with the drug to create a variety of different analgesic products. A chemical sibling and partner in the codeinone family is *hydrocodone*. Mixed with Tylenol to create Vicodin, hydrocodone is the most widely prescribed opiate in the United States. By manipulating the concentration of hydrocodone and acetaminophen in a final compound, modern pharmacy has created alternatively popular narcotic and non-narcotic combinations such as *Lorcet* and *Norco*. This month's drug is more powerful than hydrocodone. It is frequently prescribed in situations where Vicodin is inadequate for the amount of pain being treated.

This month's drug is the subject of widespread diversion from legitimate medical use. Although the drug is manufactured in various compounds and concentrations, there is one particular formula that is extensively sought by narcotic addicts. In fact, in some large American cities, the abuse of this narcotic surpasses the levels seen with heroin. When legitimately used in the treatment of pain, this month's drug is almost always taken in oral form. Depending on the manufacturer and the formula used, this month's drug is available in a capsule or in tablet form. There are also several liquid-syrup preparations containing this drug. In its tablet, powdered form, the drug is water-soluble and easily dissolved. The drug's water solubility makes it amenable to intravenous injection. Added ingredients of acetaminophen and aspirin make certain preparations of this drug very dangerous to use. Chronic use of those types products can cause liver damage due to acetaminophen toxicity. One particular modern variant of this month's drug has unfortunately become a near perfect vehicle for drug abuse by means of smoking, intravenous injection, or snorting. *This lone version of this month's drug is responsible for a large part of the healthcare market that is now in need of Suboxone (Buprenorphine) detoxification.*

In 1996, the burgeoning practice of pain management substantially changed with the introduction of a new formula for this month's drug. *Purdue Pharma* created an extended *time released* version of the drug. This *continual release* narcotic quickly became one of the most widely prescribed opiates in the country. For many chronic pain patients who used the drug as directed, it was a near miracle. For others, the drug's new extended release formula led to the misery of dependency and drug addiction. At present, this drug is one of the most notoriously abused substances in America. Coined "hillbilly heroin," this drug sunk quick roots in states like Kentucky and Florida. It also raced into rural communities where it quickly decimated those who chose to experiment with it. Produced in four different strengths, the time-release form of this month's drug can be found on the streets of most major cities where it's typically smoked or injected. Because the time-release formula binds the drug and delays its absorption into the blood stream, abusers must crush and pulverize the tablet so as to allow for its immediate uptake and action at opiate receptor sites. Sadly, the drug has become popular and hip with younger drug abusing crowds.

This month's drug in all its forms is commonly found at "cabinet parties." Popular with high school students, "cabinet parties" require invitees to bring whatever drugs they can find in their parent's medicine cabinets to a party site where they can then be shared and experimented with others. As a commonly prescribed as it is, the drug can be expected to be in the punch bowl at most "cabinet parties." The drug has found its way into the club scene as well where its use is considered fashionable and chic. For older and more experienced narcotic abusers, the time-release format blends very well when used orally in combination with other well-known sedative drugs. *Valium*, *Xanax*, and *Soma* (see this month's Hotline Call report) work in synergy with this month's drug to create an unrivaled euphoria that some users claim is far superior to that of heroin. These drug cocktails are prone to accidental overdose, they're extremely dangerous, and following chronic use can lead to dual drug dependencies that are profoundly difficult to treat.

This month's drug: *oxycodone*

In the time or extended release form, this month's drug is known as *Oxycontin*. In traditional forms, the drug is or has been available in product names such as *Percocet*, *Percodan*, and *Roxicodone*. On the street the drug hails as "Roxies" or "Oxy's."

Readers with questions relating to *oxycodone* or *Oxycontin* abuse may obtain more information from MEDTOX's Drug Abuse Recognition (DAR) staff. The DAR Program is comprised of certified drug abuse experts (DAR instructors) who have extensive experience as drug enforcement agents working in federal, state, and local agencies. Readers who are interested in DAR training should contact the DAR Program staff at darsprogram@mac.com for more information.

MEDTOX has also begun to offer special pain management risk management services under the auspices of the *ProtectMD* Program. Like DAR, *ProtectMD* is a program staffed by veteran drug enforcement personnel and boarded pain management physicians who are experts in the practice of it. *ProtectMD* staff provides clients with a variety of services that help secure pain management practices from fraud and abuse. Physicians and other healthcare providers interested in the suite of services of *ProtectMD* may obtain more information by emailing ProtectMD@mac.com.



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