Questions & Answers

Synthetic Cannabinoids (Spice, K2, etc.)

The following document represents a series of questions submitted by drug court practitioners associated with synthetic cannabinoids (Spice, K2, etc.) and the use of herbal incense products by clients in a problem-solving court environment. It is important to understand that the laws, the detection methods, indeed, even the composition of these herbal incense products is in a state of evolution. The information available to knowledgeable professionals in the field changes on almost a daily basis. In turn, a court's response to this shifting situation will need to be flexible and timely in adapting to these on-going changes.

The answers to practitioner's questions have been provided by Paul L. Cary, M.S., director of the Toxicology Laboratory at the University of Missouri. Mr. Cary's responses are based upon currently accessible information from scientific and government sources, as well as reports from drug court professionals. It is important to acknowledge that there is a dearth of research on the absorption, distribution, metabolism and elimination of synthetic cannabinoids. There is also limited definitive information on the actual chemical make-up of many of the herbal incense products being marketed - making the effectiveness of available detection methods unclear. This document will be updated as additional information becomes available.

Q Where can I find general information on these herbal incense products and the use of synthetic cannabinoids?

A A fact sheet is available from the Drug Court Resource Center that can be accessed as a pdf at the following URL:

http://www.ndcrc.org/content/spice-k2-and-problem-synthetic-cannabinoids

This document provides a description of synthetic cannabinoids, details on the composition of these herbal incense products, a description of the physiological effects associated with their use, an outline of the legal status of these materials and provides some surveillance suggestions.

Q Our community is in the process of developing legal restrictions for these herbal incense products and synthetic cannabinoids. Which chemicals should be included in formulating legal controls?

A The following is a comprehensive list of known synthetic cannabinoid chemicals that reportedly bind to marijuana receptors in the brain; plus language prefacing the chemicals to be restricted:

Any material, compound, mixture, or preparation that contains any quantity of the following substances, their salts, homologues, isomers, and salts of isomers, unless specifically excepted, whenever the existence of these salts, homologues, isomers, and salts of isomers is possible within the specific chemical designation:

- 1-pentyl-2-methyl-3-(1-naphthoyl)indole, also known as JWH-007;
- (2-Methyl-1-propyl-1H-indol-3-yl)-1-naphthalenylmethanone, also know as JWH-015;
- (1-pentyl-3-(1-naphthoyl)indole), also known as JWH-018;
- 1-hexyl-3-(naphthalen-1-oyl)indole, also known as JWH-019;
- naphthalen-1-yl-(1-butylindol-3-yl)methanone, also known as JWH-073;
- 4-methoxynaphthalen- 1-yl- (1-pentylindol- 3-yl) methanone, also known as JWH-081;
- 4-methoxynaphthalen-1-yl-(1-pentyl-2-methylindol-3-yl)methanone, also known as JWH-098;
- (6aR,10aR)-3-(1,1-Dimethylbutyl)-6a,7,10,10a-tetrahydro -6,6,9-trimethyl-6H-dibenzo[b,d]pyran, also known as JWH-133;
- 7-methoxynaphthalen-1-yl-(1-pentylindol-3-yl) methanone, also known as JWH-164;
- (1-(2-morpholin-4-ylethyl)indol-3-yl)-naphthalen-1-ylmethanone, also known as JWH-200 or WIN 55,225;
- (1-pentyl-3-(2-chlorophenylacetyl)indole) or 2-(2-chlorophenyl)-1-(1-pentylindol-3-yl)ethanone, also known as JWH-203;
- 4-ethylnaphthalen-1-yl-(1-pentylindol-3-yl) methanone, also known as JWH-210;
- (1-pentyl-3-(2-methoxyphenylacetyl)indole) or 2-(2-methoxyphenyl)-1-(1-pentylindol-3-yl) ethanone, also known as JWH-250;
- 1-pentyl-3-(4-chloro-1-naphthoyl)indole, also known as JWH-398;
- 2-[(1R,3S)-3-hydroxycyclohexyl]- 5-(2-methyloctan-2-yl)phenol, to include its C6, C8, and C9 homologues; also known as CP 47,497;
- (2S,4S,4aS,6R,8aR)-6-(hydroxymethyl)-4-[2-hydroxy-4-(2-methyloctan-2-yl)phenyl]-1,2,3,4,4a,5,6,7,8,8a-decahydronaphthalen-2-ol, also known as CP 55,244;
- 2-[(1R,2R,5R)-5-hydroxy-2-(3-hydroxypropyl) cyclohexyl]-5-(2-methyloctan-2-yl)phenol, also known as CP 55,940;
- (6aR,10aR)- 9-(Hydroxymethyl)- 6,6-dimethyl-3-(2-methyloctan-2-yl)- 6a,7,10,10a-tetrahydrobenzo [c]chromen- 1-ol, also known as HU-210; Note: HU-210 is currently a Schedule I controlled substance under the Controlled Substances Act
- (6aS,10aS)-9-(Hydroxymethyl)- 6,6-dimethyl-3-(2-methyloctan-2-yl)- 6a,7,10,10a-tetrahydrobenzo [c]chromen-1-ol, also known as HU-211 or dexanabinol;
- R)-(+)-[2,3-Dihydro-5-methyl-3-(4-morpholinylmethyl)pyrrolo [1,2,3-de)-1, 4-benzoxazin-6-yl]-1-napthalenylmethanone, also known as WIN 55,212-2.

Q Do standard drug tests detect the presence of synthetic cannabinoids in urine following the smoking of herbal incense products?

A Conventional drug testing methods used by drug courts (either on-site, rapid tests or laboratory-based analyses) will not detect the presence of synthetic cannabinoids in urine. While similar in structure to marijuana, the synthetic cannabinoids are currently not detected by standard cannabinoid testing methods.

Q Are there any specialized testing methods available for the detection of synthetic cannabinoids in urine?

A There are currently no on-site screening devices (instant tests) for the detection of synthetic cannabinoids. At the present time, there are also no "immunoassay-like" screening tests available on analyzers in drug testing laboratories. However, there are several national laboratories that have begun to offer urine synthetic cannabinoid testing commercially, utilizing sophisticated LC/MS/MS technology.

Q Are these mass-spectrometry tests for the detection of synthetic cannabinoids accurate and reliable?

A This question is difficult to answer. As with any emerging testing technology that is introduced into the criminal justice environment, it takes time to evaluate the evidential admissibility of the new testing methods. The laboratories offering synthetic cannabinoid testing are utilizing very sophisticated instrumentation and have extensive experience in the forensic drug testing arena. That said, at the present time there are no peer-reviewed, published methods for the analysis of these synthetic cannabinoid chemicals in urine. Further, there are no certified quality control materials to independently evaluate testing accuracy or proficiency surveys to assess the reliability of the new methods being utilized. The determination of accuracy and reliability of these new testing methods will require some time in order for the data to be accrued and subsequently evaluated by the scientific community.

Q How long do synthetic cannabinoids remain detectable in urine following smoking?

A At the present time there are no authoritative studies or publications that provide a definitive detection window for synthetic cannabinoids in urine. While it is reasonable to assume that elimination patterns of synthetic cannabinoids would be similar to that of marijuana and its metabolites, there is currently no research available to answer this question with specificity.

Q What urine cutoff concentrations should be used when testing for synthetic cannabinoids in urine?

A Urine cutoff levels for the detection of synthetic cannabinoids and their metabolites have not been established. That does not mean that the synthetic cannabinoid testing should have no cutoff levels. All forensic drug tests should have designated drug concentrations that allow the consistent differentiation between a positive and a negative sample. These cutoff levels can be established by authoritative governing agencies, by court policy or by the testing laboratory itself (based upon the limits of method detection).

Q We have received information from a laboratory that states they have a "SAMHSA certified test" for Spice and K2. Is it important to use the SAMHSA certified synthetic cannabinoid test for drug court clients?

A SAMHSA does not certify tests - SAMHSA certifies laboratories. So there is no such thing as a "SAMHSA certified test".Second, synthetic cannabinoids are not covered under the federal rule - therefore this testing cannot be certified by SAMHSA under any circumstances at the present time. While the laboratory offering this testing may be SAMHSA-certified, these claims appear misleading. Currently, there are no official forensic standards for synthetic cannabinoid testing.

Q What specific drugs are being detected by the laboratories offering synthetic cannabinoids testing?

A The specific synthetic cannabinoids being detected will vary from laboratory to laboratory. Laboratories offering testing using mass spectrometry techniques are targeting selected compounds from the list of chemicals outlined in the answer to Question Q2, in addition to some of the metabolites of those compounds. However, some of those chemicals are difficult to obtain and their breakdown products are not well understood.

Because there are no preliminary, broad-range screening techniques for the class of synthetic cannabinoids, the alternative testing approach is to select specific synthetic cannabinoids for detection. The ability of a laboratory to obtain these chemical compounds will dictate how many of the synthetic cannabinoids they are able to detect. Check with the laboratory to determine which synthetic cannabinoids are included in the testing.

A significant challenge for laboratories offering testing for synthetic cannabinoids is the inconsistencies in the production of herbal incense products. A particular brand of herbal incense may contain one or more synthetic cannabinoid chemicals in one batch and a different combination of synthetic cannabinoid chemicals in the next batch. The changes in herbal incense composition is often an effort by the producer to circumvent the legal restrictions already in place.

Q Is it true that drug courts that have begun testing for synthetic cannabinoids have identified a high incidence of abuse with many clients testing positive?

A There are no large-scale, epidemiological studies investigating the prevalence of synthetic cannabinoid use. There are a small number of anecdotal reports that indicate significant use of herbal incense products among drug court clients; however, the client selection process may have skewed the significance of these reports. Testing for synthetic cannabinoids is more costly than standard drug testing, therefore courts are only testing those participants who are suspected of covert herbal incense use.

In one court report, for a "selected" client group, seven out of nine participants tested positive for synthetic cannabinoids. A different court reported 12 out of 17 suspected users tested positive for synthetic cannabinoids. The second court further reported that an additional five clients self-reported the use of herbal incense products following the identification of the original positive clients. Whether these findings are representative of the broader drug court population is far from clear.

Q Should synthetic cannabinoids be addressed in our client contract?

A Absolutely! Drug courts should review their client contracts to ensure that the use, distribution and possession of synthetic cannabinoids and related herbal incense products are expressly prohibited.

Q Should client sanctioning for synthetic cannabinoids be different from other positive drug testing results?

A This decision rests with individual court programs, but consider the following. Clients using synthetic cannabinoids do so with the knowledge that these products are not routinely detected in standard drug tests. In other words, the use of herbal incense products is an attempt by many participants to circumvent the drug use monitoring efforts of the court. In that respect, the use of synthetic cannabinoids is more akin to specimen tampering (an effort to defraud the court's surveillance strategies). Some courts may view a positive synthetic cannabinoid result as a more significant transgression than a routine participant relapse and sanction accordingly.

Q Is it true that hospital emergency departments are experiencing an increase in admissions due to poisonings associated with the use of synthetic cannabinoids?

A Yes. And, the trend is disturbing. Recently, the American Association of Poison Control Centers reported that during the first half of 2010, there were 567 cases (in 41 states) in which people suffered adverse reactions to herbal incense products. This is in contrast to only 13 cases reported in all of 2009 - an increase of over 4000%.Synthetic cannabinoids may still be legal in many parts of the country, but that does not make the use of herbal incense products safe.