

Designer Drugs-The Latest Twist to the Legal High Business

Rob Goetz PharmD, DABAT

Past

In the 1980s and 1990s, the nation faced the danger of the “lookalike” pill. These pills contained substances commonly found in products available over the counter in drug stores as well as in convenience stores and gas stations. They typically contained caffeine, ephedrine and phenylpropanolamine (PPA), which were all legal and available without a prescription at the time. The drug abuse community was attracted to these pills because they looked like stronger amphetamines that were already scheduled. The problem with these look-alike pills was that they could contain up to five times the caffeine contained in a typical diet-aid, which put the user at risk for heart and/or respiratory failure.

Since then, PPA and ephedrine have been removed from the market. Combinations of caffeine and synephrine continue to be sold as dietary supplements. Energy drinks like Red Bull and slow drinks like Blue Cow and Drank are marketed as dietary supplements. The Dietary Supplements Health Education Act denies the FDA from requiring safety and efficacy studies on products sold as dietary supplements as long as they are not specifically marketed as preventing, treating or curing a disease.



Present

In the latest twist, entrepreneurs search the published research of medicinal chemists and pharmacologists to identify chemicals to sell as abuse drugs. Specifically the work of three scientists, Dr. David Nichols**, Dr. J.W. Huffman and Dr. Alexander Shulgin, figure prominently in the current trend. Once the entrepreneur identifies a promising candidate (research chemical), they find a manufacturer willing to produce it in large quantities. Its then cut, repackaged and sold in gas stations, convenience stores, head shops and on the internet often with a warning that research chemicals are not for human consumption. Two of the most popular designer drugs currently available are K2 and other products that contain analogs of THC (marijuana), and Bath Salts which contain various stimulants related to cathinone. Similar to the look-alike drugs from the past, current producers avoid prosecution by utilizing loopholes in the law. The current list of chemicals includes hundreds of molecules, none of which have been studied thoroughly, if at all, in humans. The entrepreneurs have contingency plans in place to substitute a different chemical if government agencies act to ban a particular chemical in current use.



** Dr Nichols is a 1969 University of Cincinnati graduate and currently a pharmacologist and medicinal chemist at Purdue University. He is considered the world's top expert on psychedelic drugs.

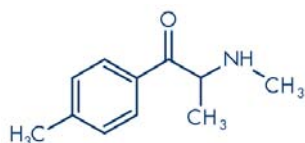
Synthetic Cathinones

“Bath Salts”, “Plant Food”, “Stain Remover”, “Not for Human Consumption”

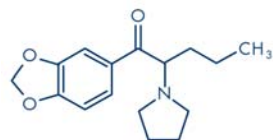
Jan Scaglione PharmD, DABAT

What are they?

Part of a new class of “beta-keto” amphetamine designer drugs. Includes mephedrone, methylene, butylone, MDPV (3,4-methylenedioxypropylone). Similar to amphetamines and cathinone (from the Eastern African Khat plant).



Mephedrone (4-methylmethcathinone, 4-MMC)



MDPV (3,4-methylenedioxypropylone)

Brand Examples:

Ivory Wave
White Horse
Moon Dog
White Horse
Ocean Burst
Blizzard
White Knight

Zoom 2
Infinity
Down 2 Earth
White Dove
Vanilla Sky
Purple Wave
Blue Silk



What are the effects?

Stimulant properties: Increases norepinephrine, dopamine, serotonin

Desired effects: Increased alertness, excitement, increased sex drive, feeling of stimulation– mixture of effects of cocaine and ecstasy

Commonly reported *adverse* effects: tachycardia, agitation, hypertension, seizures, chest pain, visual and auditory hallucinations, insomnia, anorexia, teeth grinding

Several deaths in U.S. have been associated with the use of these products: often bizarre behavior followed by excited delirium/violent self-harm during agitated/delusional state.

What are the legal issues?

It was considered a “legal high” in the UK, but media attention and high profile deaths with links to mephedrone led to it being banned in April 2010.

U.S.: Not Federally banned, but many states have banned these products, including LA, MI, KY, ND, AL, FL, NJ, GA, UT, VA, WVa. Many other states and cities legislation is pending. OH signed a law on July 17th 2011 banning these products, although it will not take effect immediately.



K2-Chemically Engineering a “Legal” High

Rob Goetz PharmD, DABAT

And

Jan Scaglione PharmD, DABAT

The labels on the package may be branded ‘K2’, ‘K3’, ‘Spice’, ‘Mister Nice Guy’, ‘Barely Legal’, or countless others. In many areas of the country they have been sold as herbal incense, a legal alternative to smoking marijuana, promising a ‘legal high’. What they really are is a mixture of herbs and spices that are sprayed with a synthetic compound chemically similar to the active ingredient in marijuana, THC. There are literally hundreds of these synthetically derived chemicals, and most of them are identified by a series of letters and numbers. Examples include HU-210, HU-211, JWH-018, CP-47,497, and JWH-073. When smoked, the chemicals act in the brain at the same receptors that marijuana does, giving them the designation as synthetic cannabinoids. Synthetic cannabinoids represent one of the most recent forms of ‘designer drugs’ produced by rogue chemists that want to market a product that produces a high, but one that hasn’t been outlawed yet. Many of these compounds were originally created legitimately by chemists working in research areas trying to formulate new drugs for therapeutic purposes.

So far, little is known about the acute or chronic toxic effects of the synthetic cannabinoid compounds. Smoking these designer drugs has a profound effect in the brain, leading to a more intense response than that experienced with smoking marijuana. Side effects reported to poison control centers include the following; increased heart rate, confusion, nausea, vomiting, hallucinations, confusion, agitation, seizures, dilated pupils, and drowsiness.



Very little is known regarding how these compounds actually work in the body. Because the type and amount of the chemicals vary considerably from batch to batch, even in the same product, accidental overdose with a risk of severe psychiatric complications may occur. Additionally, experts speculate that some of these synthetic cannabinoids have such potent effects in the brain that they may possibly lead to life-threatening situations in overdose, may carry a high risk of dependence, and could potentially cause certain cancers with prolonged use.

In March, 2011, the Drug Enforcement Administration (DEA) exercised its emergency scheduling authority to control five synthetic cannabinoid compounds (JWH-018, JWH-073, JWH-200, CP-47,497, and cannabicyclohexanol). These five chemicals will be controlled for at least 12 months, with the possibility of a six month extension, while the DEA and the United States Department of Health and Human Services (DHHS) further study whether these chemicals should be permanently controlled. They are currently designated as Schedule I substances, the most restrictive category under the Controlled Substances Act. Although the DEA has taken action against some of these designer drugs, there are still many more synthetic compounds being manufactured for “legal” use, turning this into a “cat and mouse” game. At the time of this report, at least 38 states in the U.S. have passed legislation making the five compounds identified by the DEA, and in some cases, all synthetic cannabinoids, permanently illegal.



VIP at DPIC

Robyn Davis MSN, RN, CSPI

Prescription drug abuse continues to be a growing epidemic in the United States. Director of the White House Office of National Drug Control Policy (Drug Czar), Gil Kerlikowske, visited Cincinnati Children's Hospital's Drug and Poison Information Center (DPIC) on July 11th to announce President Obama's 2011 National Control Drug Strategy.

Drug use and its ramifications are costly in many regards. Drug-induced deaths now outnumber gunshot deaths in America. And the economic impact is also substantial. According to the U.S. Department of Justice's National Drug Intelligence Center, illicit drug use on society totaled more than \$193 billion in 2007. As of this publication, 2007 was the last year for which data are available.

Focus:

- Drug prevention and early intervention programs in healthcare settings
- Diverting non-violent drug offenders into treatment instead of jail
- Funding more scientific research on drug use, expanding access to substance abuse treatment, and supporting those in recovery

Goals:

- Decreasing drug use among youth by 15 percent
- Decreasing drug-induced deaths and drug-related morbidity by 15 percent
- Decreasing drugged driving by 10 percent.



R. Gil Kerlikowske at DPIC on July 11th!

This was Kerlikowske's first visit to DPIC, however the former Drug Czar, John P. Walters, made two separate appearances to DPIC between 2005 and 2009!

<http://www.whitehousedrugpolicy.gov/strategy/index.html>

<http://www.whitehousedrugpolicy.gov/strategy/2011StrategyExecutiveSummary.pdf>

<http://www.samhsa.gov/Financing/category/Illegal-Drugs.aspx>

© 2011 By the Cincinnati Drug & Poison Information Center (DPIC) and the Cincinnati Health Department.

Editors: Alysha Behrman RN, MSN, CSPI, OCPS II, CARN, Sheila Goertmoeller RPh, CSPI, OCPSII, Jan Scaglione, BS, MT, PharmD, DABAT, Gaylene B. Tsipis, MS, RPh, OCPS II

Editorial Board: Earl G. Siegel, PharmD, OCPS, Rob Goetz, PharmD, DABAT, Alicia Aumentado, RPh, OCPS, E. Don Nelson, PharmD, OCPS and Marsha A. Polk, HPT, OCPS.

The opinions expressed herein are those of the contributing authors and do not necessarily reflect the views of the editor, publisher or supporting institutions. DPIC is a service of the Cincinnati Children's Hospital Medical Center and Children's Hospital Research Foundation. Services are also supported by: the US Department of Health and Human Services (HRSA), the Ohio Department of Health, Hamilton County Mental Health and Recovery Services Board, Butler County Alcohol and Drug Addiction Services Board and the Ohio Department of Alcohol and Drug Addiction Services (ADADAS). Additional support for DPIC services is provided by Akron Children's Hospital Medical Center and additional member Hospitals.