



MEDTOX® Journal

Public Safety Substance Abuse Newsletter

January 2010

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If you have suggestions, questions or articles you would like to see featured in future issues please contact Lisa Mize at: lmize@medtox.com

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Announcements

Coming Soon!!!!

MEDTOX is pleased to announce that the MEDTOX Journal Blog will be up and ready for viewing and active discussion in February 2010. The MEDTOX Journal Blog has been created for people in any professional or personal setting searching for reliable information regarding new drug use trends, substance abuse or drug testing.

Blog Benefits:

- User friendly website
- E-mail notification of new articles
- Comments section for providing feedback on articles
- Ability to ask the author questions about article information
- Search field allows you to find requested information in all articles
- Accessible on any computer with internet access

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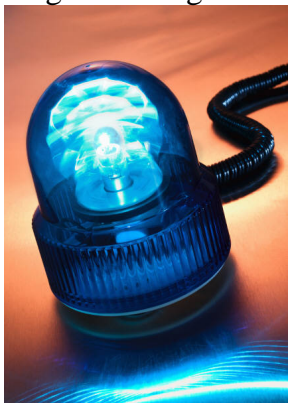
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DAR Newsletter Special Bulletin: Reports of "Mephedrone" Seizure in the U.S. & Canada

Drug enforcement authorities in the U.S. and Canada are reporting the emergence of a new and potentially dangerous drug of abuse. Widely known as "mephedrone," the drug possesses the chemical designation of 4-methylmethcathinone. The drug is also identified and referred to as 4-MMC and 4-methylephedrone. The substance has no current accepted medical applications in the U.S. In the past, this drug has been a component of fertilizers and plant foods that were manufactured overseas. At present, mephedrone can be purchased from a variety of online sources, most of which appear to be operating in the U.K. and Europe. Mephedrone is unregulated and does not fall under the auspices of the Controlled Substances Act.



A mephedrone "high" possesses characteristics that are attractive to younger drug users. Those cases of reported mephedrone overdose all involve teenagers and young adults.

There are claims that mephedrone abuse has led to overdose deaths in Europe, as a result, the drug is allegedly banned in Norway, Finland, and Sweden. The drug has been seized in the U.S. on both east and west coasts. Mephedrone suppliers tout the fact that the drug is the means towards getting legally "high" and that most modern drug testing systems are incapable of detecting its use. The Internet serves to enhance the "buzz" and what appears to be widespread interest in it.

Mephedrone is best characterized as a central nervous system stimulant. DAR trained readers will find that someone under the influence of the drug will present with physical signs and symptoms consistent with CNS stimulants. Methcathinone, a related controlled substance and psychoactive drug, has been out on the market and in the streets for nearly 20 years. Widespread demand for that drug never materialized and as a result, methcathinone has been not much more than a footnote in the annals of drug abuse. Mephedrone is the chemical net result of manipulation of methcathinone. The drug possesses the psychoactive potential of the amphetamines and phenethylamines. In addition to psychophysical stimulant effects, a mephedrone high may also trigger some of the effects found with ecstasy use. The drug causes a hodge podge of psychotropic effects that will vary in intensity from user to user. Dopamine, norepinephrine and serotonin (5-HT) neurotransmitter systems bare the brunt of mephedrone's insult to the central nervous system. Mephedrone research is scant.

On the street, mephedrone is referred to by a variety of different names including "cat food," "meow," "drone," and "bubbles." Internet pricing for mephedrone runs at about \$20 (U.S.) for a gram. Multi-gram and multiple-ounce quantities are relatively easy to find. Shipping costs from the country of origin to the U.S. can significantly increase the purchase price of mephedrone. As has been the case with abuses of other types of drugs, use of mephedrone by children and teens will likely result in clusters of kids who end up in school nurses offices or local emergency rooms with a bizarre array of physical signs and symptoms. In addition to stimulation and possible agitation, users may experience irritation to the nasal passages, headache, nosebleeds, nausea, and frightening hallucinations. The drug can be inhaled or snorted in its base powder form. The drug has also been sold in capsule form, and thus can be taken orally. Mephedrone is mostly found as a white to off-white powder that possesses little to no odor.

The future for mephedrone as a drug of abuse is unclear. But readers working with younger groups of substance abusers or with those with elevated risk for substance abuse should be keen to signs of mephedrone use. Questions associated with identification of possible mephedrone abuse can be directed to the MEDTOX DAR Program at DARSProgram@mac.com.

Are Amphetamine Medications Used to Treat Attention Deficit Hyperactivity Disorder (ADHD) Ending Up in the Wrong Hands?

The problem of amphetamine and mixed amphetamine salts diversion is increasing. Non-medical use of ADHD medications has been increasing for several years. As reported in the Archives of Pediatric & Adolescent Medicine, the trend towards theft and diversion of psycho-stimulants used to treat ADHD is an alarming public health threat. To define the nature of the phenomenon, investigators researched telephone calls made to the National Poison Data System between 1998 and 2005. This area of study was accentuated by the results of a study of the habits of physicians who regularly prescribe the drugs in their practices. The results raise concerns.



Drugs used to treat ADHD and the related conditions of attention deficit disorder (ADD) encompass a class of very powerful central nervous system stimulants that includes amphetamine (Adderall®), lisdexamfetamine (Vyvanse®) and methylphenidate (Ritalin®). Physicians have been prescribing these drugs in increasing amounts for several years. Each of these drugs has unique capabilities as medications that arouse the central nervous system. For children and adolescents who suffer from ADD and ADHD, these drugs serve as mechanisms that balance the delicate neurotransmitter systems that regulate and dictate the orientation of activity towards excitement or relaxation. These drugs can have remarkably quieting effects for patients who suffer from the debilitating effects of these diseases. If people who don't suffer from these conditions abuse these drugs, the physical effects are powerfully stimulating and energizing. Although the public is sensitive to the stimulant effects of the widely chronicled street drug methamphetamine, (speed, crank and ice) the pharmaceutical equivalents are equally as potent and dangerous. In the minds of some drug abusers, pharmaceutical stimulants guarantee a layer of biological safety as they are inspected and regulated through a strict process of quality control. Diversion of pharmaceutical drugs into the hands of stimulant abusers is an unseen and unappreciated phenomenon.

Calls to the National Poison Data System (NPDS) increased 76% in the period from 1998 to 2005.^[1] The increase in prescription for these drugs was 86% over the same period for adolescents (10-19 years old); there was a 55% increase in calls about teen drug abuse to the NPDS for the same period in time. The surge in prescriptions for these drugs significantly exceeded the increased rate of phone calls to the poison control system. The calls generated into the NPDS mostly concerned the preparations utilizing amphetamine-based medications. Compared to Ritalin®, amphetamine-based medications were significantly linked to severe side effects and overdose related deaths. Although boys are diagnosed with ADHD at a rate of 3:1 compared to girls, 40% of the calls generated involved incidents with girls.

Methylphenidate is a widely used drug that is considered frontline therapy in the treatment of ADHD. The drug is available in different strengths and formulas as Ritalin® and Concerta®. The latter is conjured in an extended release, once a day formula. Concerta® is thought to be less prone to abuse because of its time-release formula. Crushing of the tablet for the purpose of eliciting an instant release doesn't work well.

Amphetamine is another widely used drug in the treatment of ADHD. The best-known product containing amphetamine is the psycho-stimulant, Adderall®. Like methylphenidate, it comes in various strengths and formats. Adderall® contains a mixture of amphetamine salts. Adderall is generally believed to be a stronger stimulant than Ritalin®, although their methods of action are remarkably similar. The greater potency of amphetamine compared to methylphenidate may explain why Ritalin® and Concerta®-related calls to the NPDS were fewer than those made as a result of use of amphetamine products. Like methylphenidate, Adderall® is sometimes prescribed for off-label use in the treatment of depression and pain management. Diversion of Adderall® is a frequent occurrence. The instant release version of the drug is more commonly

found on the street. Adderall® XR is the extended release form of the drug and it works similarly to the Concerta® time-release form of methylphenidate.

[1] SetikJ et al. Adolescent prescription ADHD medication abuse is rising along with prescriptions for these medications. Pediatrics 2009 Sep; 124:875

What is the Potential for Major Depression with Recovery from Methamphetamine Abuse?

Methamphetamine is a powerful stimulant drug whose rates of abuse have become epidemic in parts of the



United States. Methamphetamine seeks out and attacks a vital part of the central nervous system that controls powerful feelings of motivation, confidence, and determination. It also interferes with chemical messages that impact memory and emotion. With surgical precision, methamphetamine seeks out adrenergic neurons in the brain and causes them to release their caches of dopamine and norepinephrine. The direct effects of methamphetamine use are profound, the feelings experienced are powerfully reinforcing. Chronic use of methamphetamine can lead to a well-documented syndrome of paranoia, disturbed mood, and social withdrawal. Depletion of neurotransmitters in the brain can lead to the development of depression, and in some cases, major depression. One of the enduring challenges in treating those who are addicted to methamphetamine is the treatment and management of co-morbid depression. Untreated, depression can add to a variety of other conditions that complicate efforts to recover from methamphetamine addiction and to remain sober.

Methamphetamine (MA) addiction has been assiduously researched and studied at the University of California, Los Angeles (UCLA) through the Methamphetamine Treatment Project at the David Geffen School of Medicine. The Project has greatly contributed to the broader understanding of the biological and psychological mechanisms of MA abuse. The program has also shed great light on the propriety of various treatment methods that have been ventured or are currently used to treat MA addiction. At some recent Drug Abuse Recognition (DAR): Managing Methamphetamine seminars, MEDTOX instructors stirred up questions about the complications posed by depression for those in recovery from methamphetamine addiction. Students in these classes were all experienced in handling clients and patients with MA histories. Each student had stories where major depressive disorders led to relapse to drug use and/or otherwise disrupted a patient's process of recovery. Not long ago, the Methamphetamine Treatment Project published research results conducted into the co-occurring disorders of substance abuse and depression. Specifically, the Project analyzed data from MA abusing patients at a point three years following completion of treatment. The research involved 526 patients who underwent examinations and interviews that ascertained their risks for development of a major depressive disorder (MDD).

The results of the research were intriguing and in line with the Project's overall hypotheses. Over 15% of the subjects involved presented with the symptoms of a major depressive disorder. This correlates with the incidence of MDD included in a Beck Depression Inventory-II (BDI) score of above 20 and female. Women accounted for 70% of those with a major depressive disorder. Prior suicide attempt, self-reported history of depression, prior incidence of alcohol abuse, and intravenous route of administration was also cited as having strong relationships with the development of MDD.[1] The number of those participants who reported prior suicide attempts was 42%, nearly five times higher than the rate for the general U.S. population.[2]

These findings and related work of the Methamphetamine Treatment Project underscores the complexities that probation departments, drug courts, and social welfare agencies face when dealing with caseloads populated with clients and patients who have MA abuse histories. Frequent relapses, excessive rates for program dropout,

and "failures to report" increase the degree of difficulty in managing methamphetamine influenced caseloads. Interestingly, the Project's research connected the intravenous use of methamphetamine with higher rates of MDD. In teaching at venues across the country, DAR instructors are frequently asked "Why it is that I.V. users of methamphetamine are more difficult to handle than those who smoke or snort the drug?" Much the same observation is made with those who inject heroin. Addicts who smoke the drug present fewer problems in their court supervised treatment than those who use the drug intravenously. For some time now, public safety professionals have had a hunch that "needle addicts" faced greater hurdles and difficulties in their treatment and recovery than other addicts who used drugs by other means. The data from the Methamphetamine Treatment Project suggests that intravenous users experience major depressive disorders at a rate that is noticeably higher than those who use MA by other methods. It may well be that MDD is a confounding factor that ultimately leads to more relapse and the incidence of other related problems that complicate the processes of probation and/or participation in drug court programs.

One of the more vexing challenges for public safety and community corrections agencies is the marshaling of necessary resources to detect and treat psychiatric illness that influence substance abuse. Dual diagnosis cases are complicated matters that require well-trained and focused mental health expertise. The data and analysis of the Methamphetamine Treatment Project underscores challenges that many newsletter readers face in helping MA addicts achieve a successful recovery and a return to a profitable lifestyle. For some time to come, MA abuse will remain a formidable challenge for treatment professionals in both public and private sectors. Sensitivity to the propensity for major depressive disorder with some types of methamphetamine addicts may allow for early treatment and more productive recovery.

Readers interested in attending the Drug Abuse Recognition (DAR): Managing Methamphetamine course may obtain more information by emailing MEDTOX at DARSProgram@mac.com or by calling a regional MEDTOX Government Sales Representative.

[1] Glasner-Edwards S, Mooney L, Marinelli-Casey P, Hillhouse M, Ang A, Rawson R. et al. Identifying methamphetamine users at risk for major depressive disorder: findings from the Methamphetamine Treatment Project at three year follow-up. *Am J Addict* 2008; 17:99-102.

[2] Hasin DS, Goodwin RD, Stinson FS, Grant BF. Epidemiology of major depressive disorder: results from the National Epidemiologic Survey on Alcoholism and Related Conditions. *Arch Gen Psychiatry*. 2005; 62:1097-1106.

DAR Hotline Call of the Month: What is Phenibut and Why do People Take it?

In the 1990s, GHB (gamma-hydroxybutyrate) and GBL (gamma butyl lactone) crashed onto the party and club drug scenes as new-age alternatives to the use of alcohol and sedatives. The drugs had particular influence in the body building business as a means of attenuating the effects of anabolic steroids, as well as to spur tissue regeneration following heavy anaerobic weight training. Following stepped up enforcement of laws regulating GHB and GBL, users turned to alternative drugs and supplements that had similar physical effects, but that were not controlled or regulated. One of those substances that gained a popular following was a product called "phenibut."

The name for the "supplement" is a contraction of the drug's lengthy chemical name of beta-phenyl-gamma-aminobutyric acid. This substance is a near chemical clone of GABA (gamma aminobutyric acid), a naturally occurring ubiquitous inhibitory neurotransmitter. GABA receptors (GABAA and GABAB) in the brain are mediators of vital chemical messages that control our states of agitation and excitement, as well as those of



sedation and contentment. The euphoric effects of GHB and GBL revolve around their own actions at those same GABA receptors. GHB and GBL bear strong chemical similarities to GABA. Abuse of these drugs can lead to serious drug dependencies, stubborn addictions that are very difficult to treat. Long-term use of GHB and GBL can lead to seizures and a plethora of disorders similar to those caused by alcohol addiction. GHB remains a widely abused drug. GHB is often the drug of choice in drug-facilitated sexual assault, also known as date rape. GHB is colorless and nearly odorless. GBL liquid, on the other hand, may present with a strong chemical odor and in colors of green, blue or red.

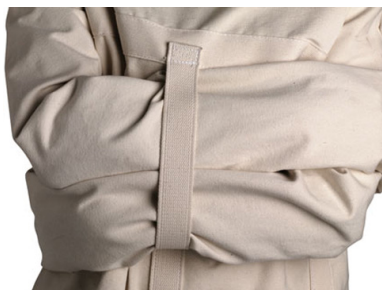
Phenibut supplement emerged as a "safer" alternative drug to GHB. Like GHB and GBL, phenibut is chemically related to GABA. A technical derivative of GHB, phenibut is biologically active at GABA receptors. Phenibut differs from GHB in that it is only mildly active at the "GABAA" receptor; however, it is a powerful agonist of the "GABAB" receptor. This distinction means that Phenibut lacks the full range and potency of GHB's sedative effects (principally mediated by action at the GABAA receptor); it is also a slower acting drug. Despite these differences when compared to GHB, phenibut use can cause noticeable sedation and relaxation. Anxiety, muscle tension, and skeletal muscle spasm can be relieved with the use of phenibut. Its effects are somewhat unpredictable and are quite user dependent.

Marketing and sales of phenibut continues. On the Internet, the drug is typically marketed and sold to bodybuilding men and women, strength trainers, and others who put their bodies through great physical stress. Phenibut is quite similar in its actions to a widely used muscle relaxant and prescription medication called Baclofen. Like phenibut, Baclofen is a GABAB agonist. Baclofen is used to treat the muscle spasm associated with multiple sclerosis and other chronic spastic diseases. The FDA does not approve phenibut to treat any conditions or disease. Phenibut is marketed and sold as a "nutrient" and "supplement," as a result it goes largely unregulated and unmonitored. Because of phenibut's pharmacological properties, chronic use of the substance may lead to addiction and dependency. Cases of phenibut withdrawal are not uncommon; some cases have required medically supervised drug detoxification. Available in an array of sizes and strengths, phenibut products are relatively easy to obtain. Email postings and Internet discussions about phenibut abound. Users of the "supplement" frequently cite its useful sedative and anxiolytic effects. Others caution new users to be careful of the supplement's potential as a drug of abuse, especially when it is used by people who have previously abused sedative-hypnotic drugs such as Valium, Xanax and Soma.

The DAR Hotline has received several inquiries about phenibut abuse in recent months. More information about phenibut, GHB and GBL can be obtained by visiting "Project GHB" on the Internet. Questions about phenibut and phenibut abuse may also be directed to the MEDTOX DAR Program at DARSProgram@mac.com.

Name that Drug: "Mad as a Hatter, Red as a Beet, If You Smoke this Stuff You'd Better Get off Your Feet."

The New Year is an appropriate time to investigate the nature and effects of a relatively new drug. A drug that only recently entered the annals of American drug abuse. This month's drug possesses some unique properties that cut across several principal drug categories. Widely claimed to be a hallucinogen, this drug also shares characteristics of other drugs, such as opiates and depressants. Adolescents and young adults popularly abuse the drug; it seems to fit in well with a wide variety of social and cultural settings. Hispanic gangs, club drug hippies, and marijuana "stoners" are all aficionados of this drug. Oddly, this drug is not a controlled substance, although there are some federal and state limitations on its sales and distribution.



Unfortunately, children are drawn to the use of this drug because of a widespread impression that it is a safe alternative to more odious substances such as LSD and Ecstasy (MDMA). This month's drug is constituted as a

plant material, a very important clue towards establishing its identity. In fact, this drug is a member of a large family of flavoring substances that are components of most kitchen spice racks. This month's drug is NOT marijuana, although in its packaged form, it may be mistaken for it.

The impact of this month's drug on the human central nervous system is curious and is the impetus behind most debate about whether or not it should retain its status as an unregulated substance. For neuroscientists, the drug is worthy of further investigation due to its chemical activation of the kappa (k) opioid receptor. The drug is comprised of several interesting and biologically active ingredients. Of great interest is Salvinorin A, a substance that appears to be an agonist of the k-opioid receptor. It doesn't appear that Salvinorin A has much to do with activity involving other types of opiate receptors. The k-opioid receptor is only weakly associated with the mediation of pain messages; it is more notable for its connections to unwanted and undesirable dysphoric effects. When the k-opioid receptor is significantly activated, hallucinogenic effects are likely to occur. But the hallucinogenic-causing mechanism of this month's drug is markedly different from the neurochemical actions of more classic hallucinogens, such as LSD and psilocybin. The direct effects of this drug help illustrate why some mixed property opiates can cause some unpleasant effects. Prescription opioids buprenorphine (Suboxone), butorphanol (Stadol) and pentazocine (Talwin) are agonists of the k-opioid receptors, and when abused these drugs can trigger effects and experiences that are distinctly dysphoric. Modern scientific research now links k-opioid receptor activity with antagonism of the mu-opioid receptor, the latter being the receptor complex most responsible for all the pleasant and euphoric effects experienced with the use of narcotics. Investigation into the role of k-opioid receptor agonists in the treatment of substance abuse is underway.

This month's drug is usually smoked. There are various methods for blending the drug into liquids and foodstuffs, but the drug loses most of its biological power when consumed in a manner other than by smoking. The drug is cultivated, packaged, and sold as a green plant material. Generally thought to have been discovered in Mexico hundreds of years ago, the drug can be planted and grown in nearly any temperate zone climate. It is widely available in the United States. The drug is extensively documented on the Internet through YouTube and other similar outlets. Although the drug is not a controlled substance under the auspices of the Controlled Substance Act, it is currently restricted by a number of states that have reacted to recent surges in cultivation, sales, and use of the drug. Users of this drug can easily find it. Marijuana paraphernalia stores ("head shops") typically sell the drug; it's packaged and sold in varying strengths. Water pipes ("bongs") are the preferred vehicle for smoking the drug. Typically packaged and sold as a green leafy substance, the drug is ingested in much the same manner as marijuana. This month's drug is short acting and generally believed to be incapable of producing a true drug dependency. There are reports of chronic use of the drug. It's unclear if chronic use of the drug is capable of causing addiction to it. Potencies ranging from 2x to 30x are available for purchase-the stronger the potency, the higher the price.

The central effects of this month's drug are short lived. Most "highs" are less than five minutes long. The very short plasma life of this drug limits its potential for abuse, but it also contributes to a widely held impression that the drug is relatively safe to use. Internet videos of people using the drug have stoked debate about the drug. Some of the YouTube vignettes have chronicled some scary and unsafe effects for those who use it. But for most who smoke the drug, the hallucinogenic effects are modest. However some users claim that they experience very intense effects when they smoke this drug. Users most commonly cite the following effects and experiences immediately following inhalation of the smoke that contains it:

- Disruptions to spatial orientation: melting into nearby objects, feelings of standing in two or three spots at once.
- Urges to laugh, a sense of sudden joy and glee.
- Colors, sound, and sense of touch are co-mingled to create a second dimension that a user can see and experience.

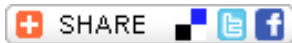
- Detachment and disorientation in senses of place and time. Users sense they are in a theater seat detachedly watching themselves act out.

Following the short high from this drug, users often describe a variety of hangover type feelings. Others claim that following the use of the drug they experience a sense of calm and detachment. Others claim that they feel uneasy and somewhat depressed. Some experts fear that chronic use of the drug may be a trigger in the development of depression. Rumors of overdosing and medical emergencies arising from the use of the drug have not been substantiated.

Although high school students are well informed in the uses of this month's drug, it is the young adult (18-25) crowd that dominates the market. The drug is known on the street as "salvia," "sage," "Sally-D," and "mint."

Drug of the Month:

Salvia Divinorum, "Diviner's Sage"



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