



MEDTOX[®] Journal

Public Safety Substance Abuse Journal

May 2009

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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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Frequently Asked Questions



Periodically MEDTOX will feature various frequently asked questions and the technical response regarding topics involving substance abuse and drug testing. If you have questions you would like to see in a future issue, please contact Lisa Mize at: lmize@medtox.com

This set of FAQ's applies to probation/parole and treatment oriented testing, not pre-employment.

Q & A Involving: Amphetamine (AMP), Methamphetamine (mAMP) and MDMA (Ecstasy) on MEDTOX Onsite Screens (Sure-Screen[®]) Devices

Question: Can cough/cold/allergy medications containing pseudoephedrine cause the MEDTOX amphetamine and/or methamphetamine drug screen to be positive?

Answer: No. MEDTOX has conducted cross reactivity studies by "spiking" urine samples separately with 100 ng/ml of pseudoephedrine. The 'spiked' urine tested NEGATIVE for amphetamine and methamphetamine/MDMA (Ecstasy). (Note: 100 ug/ml is equivalent to 100,000 ng/ml). The screening cut-offs for amphetamine, methamphetamine and MDMA are respectively set at 300, 1,000, and 1,500 ng/ml. Pseudoephedrine containing products are frequently located 'behind the counter' in many states; in addition, the quantity that can be purchased is limited and a buyer is usually required to sign for it. The product that is openly displayed and sold over the counter on store shelves usually contains phenylephrine (PE), instead of pseudoephedrine. The switch to phenylephrine was brought about by the widespread conversion of pseudoephedrine into methamphetamine. Conversion of phenylephrine (PE) into methamphetamine is much more difficult than it is with pseudoephedrine.

Question: Can cough/cold/allergy medications containing the pseudoephedrine 'replacement' phenylephrine (abbreviated 'PE' on many labels) cause the MEDTOX amphetamine and/or methamphetamine drug screen to be positive?

Answer: Yes, phenylephrine, the active ingredient of Sudafed PE, is structurally similar to methamphetamine and may cause a false positive methamphetamine screening result. **It will not cause a positive amphetamine screen.** To determine if methamphetamine is truly present, a suspected sample should be sent to the lab for GC/MS confirmation testing, since this methodology can differentiate the two.

Question: Can over the counter diet aids, asthma, or stimulant products containing ephedrine (ephedra/ ma huang) cause a positive MEDTOX methamphetamine screen?

Answer: Yes. Ephedrine is structurally similar to methamphetamine and may cause the

MEDTOX News

New Product Announcement

MEDTOX® is pleased to announce the release of our newest drug testing product the Sure-Screen® 12 Panel with buprenorphine ("For Forensic Use Only").

MEDTOX® Sure-Screen® products provide clients with No-Tolerance testing programs to screen for drugs at lower than traditional cut-off levels. See [Our Products](#) for more information.

Conference and Educational Offerings

"Bringing Excellence to Rural America"

May 31 - June 4, 2009

University of Wisconsin-Stout
Menomonie, Wisconsin
Celebrating its 25th year, this unique rural alcohol and drug abuse conference provides participants the opportunity to personally interact with other rural alcohol and drug abuse professionals, federal agency representatives, and nationally known institute faculty and resource persons. Key resource persons from throughout the United States will present 12 hour in-depth tracks, 4 1/2 hour mini-workshops and 1 1/2 hour special topic sessions on current, innovative and emerging topics.

The Scaife Family Foundation Medical Track

Includes sessions on neurobiology of addiction, identification of the addict in the hospital/clinic, physician health, detoxification strategies including Buprenorphine, benzodiazepines, xanax, ativan et.al., and current controversies in addiction.

Treatment Court for Family and Adolescents and Mental Health Court

Focuses on the unique operational issues and problems faced by rural drug court programs.

For details

See the [National Rural Institute](#) website.

MEDTOX mAMP screen to render a positive result. **It will not cause a positive amphetamine screen.** It is therefore important to send these positive screening samples to the lab for GC/MS confirmation testing. If the methamphetamine screen was 'false positive' due to ephedrine or some other cross reactant, the GC/MS confirmation (expanded amphetamine confirmation) will definitively rule out the following drugs: amphetamine, methamphetamine, MDMA, and MDA. Sympathomimetic (drugs acting as stimulants of the sympathetic nervous system) confirmation panels can be used to detect the presence of ephedrine in a suspicious sample.

Question: Will the MEDTOX AMP or mAMP Screen be positive if the person is taking methylphenidate (Ritalin™, Concerta™)?

Answer: No. Methylphenidate does not cross react with the AMP or mAMP/MDMA assays. Urines "spiked" with up to 100,000 ng/ml of methylphenidate screened 'negative' for amphetamine and methamphetamine. Abusers of methamphetamine frequently offer up an alibi for "crank" use claiming that they take Ritalin for an alleged attention deficit disorder. This sort of excuse is a poor one since Ritalin is structurally different and will not cause a positive screen for methamphetamine.

Question: Does Adderall™ (contains a mixture of amphetamine salts) cause a positive Amphetamine screen?

Answer: Yes. Adderall™, a drug widely used to treat attention deficit disorder (AAD) contains only AMPHETAMINE, there is **no** METHAMPHETAMINE in the product. Therefore, if this prescribed medication's concentration in the urine is near or exceeds the AMP cut-off threshold, the AMP screen will render a 'positive' result. The methamphetamine/ecstasy (mAMP/MDMA) screen will be negative however. A person who is prescribed Adderall must acquire a special type of prescription from his/her physician; the drug is strictly regulated under Federal Schedule II. This drug is found in populations of adolescent and adult patients being treated for ADD and ADHD.

Question: Can Phentermine (Adipex™, Ionamin™), a prescription diet drug, result in a positive Amphetamine screen?

Answer: Yes. Phentermine, a very close structural relative of amphetamine, may cause the MEDTOX AMP (amphetamine) screen result to show as 'positive'. The mAMP/MDMA screen should remain 'negative'. Phentermine was shown to cross react with the AMP assay at a high concentration of approximately 10,000 ng/ml (may vary from lot to lot and specific product used). Most confirmation panels for amphetamine/methamphetamine do not check for the presence of phentermine, its role in causing false positive screens is therefore tough to judge. The amphetamine & methamphetamine GC/MS confirmation results will be 'negative' if a positive screen result was due to phentermine cross reactivity. Again, a sympathomimetic amine confirmation can be ordered to help investigate and determine if any of the following drugs are present in a urine sample: amphetamine, methamphetamine, phentermine, phenmetrazine, d, l ephedrine, and phenylpropanolamine (PPA).

Brain Abnormalities in Chronic Methamphetamine Abusers



Newsletter readers working on the frontlines in the battle against substance abuse are becoming more and more familiar with the blank stare displayed by recovering methamphetamine addicts. Sometimes called the "1000 mile stare" or "blank affect," the empty look communicates the neurochemical disruption caused by repeated use of this powerful stimulant drug. Effecting dopamine, norepinephrine and serotonin networks, serial methamphetamine use can result in neurotransmitter depletion that leads to depression, withdrawal, anhedonia and sleep disruption. Further, it seems that chronic methamphetamine use can also lead to disruptions in the size and volume of gray-matter and white-matter in the brain.

With the continuing development of MRI technology,

History of the MEDTOX® Drug Abuse Recognition (DAR) Program

In today's economy and the fiscal situation many of us face, it is imperative that we attempt to do more drug testing with less money. The cost of on-site drug tests has dropped precipitously over the passed several years, but the costs still remain high. In light of these realities, MEDTOX is introducing a program that will bring real cost savings to your drug interdiction requirements - Drug Abuse Recognition (DAR).

You have probably heard of Drug Recognition Expert (DRE). DAR is a distinct and more efficient and proficient method of drug recognition. Below is a brief history of DAR.

Drug Abuse Recognition (DAR) in its original form was developed by the Glendale Police Department. The Glendale P.D. was supported by the California Office of Traffic Safety and the National Highway Safety Administration (NHTSA) in the development of this program.

The program was ultimately transferred to the California Narcotic Officers Association (CNOA) where it is still managed for use with police and sheriffs agencies. Requests from probation and family protective services agencies caused the developers of DAR to create and implement a form of DAR that met their parochial needs.

Drug Abuse Recognition Systems (DARSYS) was formed by some of the creators of DAR for the purpose of teaching DAR to institutions such as corrections, probation, parole and family services agencies.

MEDTOX obtained a license to DAR and currently offers the training in every modern curriculum variant. MEDTOX's DAR staff includes a co-developer from the Glendale

scientists have been able to better follow the sequence of events that occurs in the brains of methamphetamine abusers. Methamphetamine is a central nervous system stimulant drug that causes the release of dopamine, a monoamine and principal neurotransmitter in the sympathetic nervous system. Dopamine is neurotoxic; as a result there has been growing concern that excessive release of dopamine might lead to damage involving the nerve cells that are involved with its activity. In furtherance of the interests that scientists have had about this process, high-resolution MRI and computational brain mapping was employed in the analysis of the brains of 22 chronic methamphetamine users whose length of drug use averaged 10.5 years. A group of 21 people who had no history of drug abuse were used as controls in this study. The methamphetamine abusers were interviewed and examined by physicians, each met the criteria called for by DSM-IV. Cognitive function and other measurements of mood and thought processes were undertaken. Memory was also analyzed and measured.

MRI results showed that there were very noticeable gray-matter deficits in the area of the brain that includes the corpus callosum, cingulate gyrus and paralimbic belts. The cingulate area displayed the most noticeable change with an overall loss of gray matter volume that averaged 11.3%. The deficits were measured by comparing the test subject gray matter against the control subject gray matter. The Hippocampus was observed to have reduced volume, the average deficit there was 7.8 %. Interestingly, white matter volumes were 7% greater in the white matter of the methamphetamine users.

What does this all mean? White-matter and gray-matter are the types of nerve tissue that are found in our brains. Men and women have differing amounts of each, but the purpose of each type of matter is the same for both sexes. In the gray-matter there are structures that are critically involved with emotions, memory and behavior. The areas mentioned as being affected in the corpus callosum are involved to one degree or another with how we remember people and events in our lives. Deficits in gray matter may be associated with behavioral disturbances as well as a variety of mental illnesses. Violent or aggressive reactions to our environment are also regulated through some of the areas identified as having experienced volume changes. The hippocampus consists of circuitry that moves recent information and experiences into memory; this system decides what information and experiences you decide to keep in memory and that which is chosen to be forgotten or discarded.

White-matter differs from gray-matter in several ways; it all starts with the color though. As you can imagine, gray-matter appears light gray in color, white matter an off-white color. White matter is protected by an outer covering a sheath that extends over the nerve cell. Gray-matter and white-matter work together in a very complex relationship that shapes our personality. The increase in the volume of white-matter amongst methamphetamine using subjects is as interesting maybe as the volume loss is in gray-matter. The interaction between white-matter and gray-matter volume is not completely understood. It is clear that white-matter acts as a mechanism that integrates information and as a sort of switchboard that connects separate parts of the brain into a unified structure. The amphetamines have proven capabilities in elevating some aspects of cognitive function, somewhere hidden in the pharmacology of the amphetamines might be the explanation for the increased white-matter volume.

This study casts light on the insidious consequences of methamphetamine use. Concern about the long-term consequences for regular users of methamphetamine is warranted. The abnormal behavior and emotions that we often see with recovering chronic methamphetamine users may be tied to significant changes in brain anatomy. These types of studies underscore the need for better access to drug treatment and the development of better pharmacological therapeutics that can be brought to bear in the struggle to manage methamphetamine abuse.

Police Department and a staff of instructors and experts that are recognized as some of the country's most respected substance abuse experts. MEDTOX DAR staff also include addiction medicine physicians and a DAR trained pharmacist. MEDTOX substance abuse experts are available round the clock to aid our DAR trained clients.

DAR is a screening device.

Although DAR has a very high rate of test finding corroboration, it is only used to help develop probable cause. In the drug test environment, DAR helps case workers and probation officers recognize basic symptoms of drug use. DAR trained probation and parole officers also use drug testing devices at a rate that exceeds those who have not been trained.

In populations where drug testing is not mandated, or where drug testing is sporadic, DAR fills in gaps. DAR trained officers routinely cull drug users out of these populations and submit them to on-site device testing. If need be, a confirmation test can be given.

Many courts in California have held a positive DAR finding and an admission of drug test to be sufficient evidence to violate probation and/or parole. Unlike DRE trained officers, DAR trained officers understand the process of addiction and can speak about modern techniques used to treat addicts. DRE officers can only speak to symptoms taught in their program. In fact, DAR schools are routinely populated by DRE graduates who are trying to increase their expertise in addiction.

DAR officers are trained to properly question and interrogate the drug user. Unlike DRE, DAR graduates obtain admissions of drug use in over 75% of those cases where they've screened

Ketamine and its Use in Pain Management



Since the late 90's law enforcement has warily watched the trend towards increased illicit use of the anesthetic drug, Ketamine (Special K or K). Chemically related to PCP, Ketamine is a dissociative anesthetic that has human and veterinary applications. Ketamine was first synthesized in 1962 and approved by the Food and Drug Administration (FDA) for use in humans. A unique drug, Ketamine blocks messages traveling between the hypothalamus and the rest of the central nervous system. As a result, a person treated with Ketamine can be awake and but not experience pain caused by surgical procedures conducted on the limbs. Unlike most

other anesthetic drugs though, Ketamine has been discovered to have a significant analgesic effect. Ketamine can relieve moderate amounts of pain. It can do this without decreasing heart rate or gastrointestinal tract activity.[1]

For those readers who are interested Ketamine is classified as an antagonist of N-methyl D-aspartate (NMDA) receptors in the dorsal horn of the spinal cord. Ketamine inhibits the binding of excitatory amino acids, such as glutamate to NMDA receptors; this sort of action blocks the transmission of painful stimuli messages. It's this activity at NMDA receptors that's thought to be the basis for Ketamine's analgesic properties. Further, Ketamine seems to inhibit the reuptake of dopamine and serotonin, it also increases levels of circulating norepinephrine. Ketamine is highly fat-soluble and is quickly absorbed following administration. Ketamine metabolism produces a pharmacologically active metabolite called norKetamine.

For Ketamine users found on the street, signs of drug influence somewhat resembles the profile of a PCP abuser. Unlike PCP, its insidious chemical cousin, Ketamine use does not cause hyper-agitated states, psychosis or hallucinations. For DAR trained readers, Ketamine users will display horizontal and vertical nystagmus; pulse will likely be elevated, and the internal clock will be fast. Although Ketamine doesn't produce the bizarre psychological effects that PCP does, users will often experience a pleasant dream-like feeling while under the influence.[2] At higher doses of the drug, Ketamine users may display a form of gait ataxia that police officers have coined, "moon-walking." Spatial disturbances and scrambled messages into the central nervous system can cause an array of balance and speech impediments. Chronic Ketamine use can result in addictive behaviors; abuse of the drug is not thought to lead to dependency.

What does the future hold for Ketamine? It is very likely that Ketamine will be more frequently used in community health settings to treat pain. Research is clearly indicating that low doses of Ketamine used on opioid-needing patients reduces pain and lessens the demand for narcotics. This opiate sparing effect is what has pain management and other medical professionals curious. With rapid expansion in the practice of pain management in America, physicians are searching for alternatives to the prescribing of large amounts or high dose opioids. Over the past decade, doctors have loosened the grip on opioids for the treatment of acute and chronic pain. Drugs such as Oxycontin, MS Contin and Vicodin have now become public safety problems as a result of widespread fraud and drug diversion that's spilled them into the streets. A huge underground demand now exists for those drugs mentioned above as well as for other like-substances such as Percocet (oxycodone), Lortab (hydrocodone), Norco (hydrocodone) and the various fentanyl products.

Will expanded use of Ketamine in the treatment of pain result in a community substance abuse problem similar to what has happened with Oxycontin? It's unlikely. For the most part, Ketamine will be prescribed by only those physicians who are trained or "boarded" in the practice of pain management. In addition amounts of Ketamine are likely to be found in local hospital emergency rooms where the drug is used in special types of pediatric procedures. Ketamine is not a drug that a family practitioner is likely to prescribe. Ketamine use will probably remain confined to special medical settings. Conditions such as multiple sclerosis, neuropathic pain and cancer pain are types where Ketamine is proving particularly effective. Continued research may prove that Ketamine can be mixed with drugs to treat other painful conditions as well, this all remains to be seen.

Ketamine is and will continue to be a good veterinary anesthetic. In fact, your own beloved pet dog or cat has probably had a Ketamine "trip" or two as a result of trips taken to the vet's office

positive for drug use. MEDTOX has taken a "big picture" approach towards the problem of drug abuse and drug testing. We do more than sell drug testing. We are committed to bring experience, product innovation, quality, and overall value to our customers. We are genuinely committed to your drug testing program, and the offer of DAR training demonstrates that commitment. Best of all, MEDTOX offers DAR at no charge to its customers that qualify.

for teeth cleaning. At the vet's Ketamine, (Ketavet) is routinely injected into stressed out animals in an effort to mellow them out enough so that a toothbrush can be rubbed over their teeth. Veterinary Ketamine is frequently stolen and diverted to the street. Special K users will take Ketamine containing solution (injectable) and boil it and evaporate off the drug itself. Once reduced to a powder form, users will "snort" the drug (intranasal ingestion). A Special K high will last between 2 & 3 hours.

[1] Hocking, G, Ketamine in chronic pain management; an evidence based review. *Anesth Analg* 2003; 97(6): 1730-9.

[2] Fine, PG. Low-dose Ketamine in the management of opioid nonresponsive terminal cancer pain. *J Pain Symptom Manage* 1999; 17(4) 295-300.

A DARS Hotline Call



In past newsletter editions, the Medtox DARS team has uncovered an increasing trend of dextromethorphan (DM, DXM) abuse amongst adolescents and young adults. In the case of DM consumption, abusers seek out cough syrups that contain the drug; consuming all or part of the bottle. Often times, abusers will mix the cough syrup with alcohol for an enhanced set of effects. The intent of the abuser is to get high off of the hallucinogenic and dissociative anesthetic properties that the drug possesses.

A dextromethorphan caused drug high blends the qualitative aspects of drugs like L.S.D. and Ketamine into a unique set of sensations that are novel and cheap. At present, Robotussin DM is one of the better-known DM cough syrups, but Coricidin tablets and Delsym sustained release DM products are also popular. People who choose to get high on dextromethorphan are said to be "robo-tripping" or "dancing." Codeine based cough syrups have a separate following of aficionados who prefer that drug's opiate-styled high over that of a dextromethorphan "out of body" experience. There are other cough syrups that contain yet another sedative drug called promethazine (Phenergan). This drug when abused at high doses can cause experiences and feelings that are similar to high dose abuse of dextromethorphan.

In this Hotline call, a Southern California based probation officer called the DAR Hotline in early April with a question about the use and abuse of dextromethorphan based cough syrups. The officer had just left drug court and had listened to a conversation that a drug court participant had with the judge. The probationer-client had explained that a recent arrest for drunk in public was not caused by a relapse to cocaine use; it was rather a case of accidental ingestion of a bottle of Robitussin.

Digging into the story, the magistrate in this case obtained an admission from the probationer. The probationer had actually developed a compulsive pattern of dextromethorphan consumption, one where she was steadily increasing the concentration and frequency of her drug consumption. The probationer remarked that she thought that the drug was safe because it's availability as an over the counter cough suppressant. She went on to explain that the drug's effects allowed her to distance herself from unwanted emotions and anxieties. She explained her experiences as being detached from the sights and sounds of things going on around her. The defendant said that she'd now learned that there is a limit to the amount of dextromethorphan that she can safely take. For this probationer, no amount of dextromethorphan cough syrup is safe to take. This probationer's cocaine addiction had become redirected into the abuse of dextromethorphan. The probationer was returned by the court to a more intensive outpatient rehabilitative program.

Dextromethorphan (DM) is a drug that is widely, although infrequently abused, but the phenomenon stays well below the radar of most public and private drug abuse surveillance systems. Since MEDTOX DAR hotline inception, there has been a steady stream of callers who have asked for information about DM cough and cold tablet abuse. Most of the calls have dealt with adolescent and young adult use of the drug, but there have been some situations involving chronic use by adults. Because of its pharmacological characteristics, physical dependency to DM is unlikely. As this Hotline call reveals, some substance abusers may

the core drug coupled with enhancing effects of additive drugs like codeine can render a drug high that is seductive. People addicted or physically dependent on this drug can become "strung out" and be in need of quick medical treatment.

What Drug Am I?

Answer: Butalbital (Fiorinal, Fioricet, Fioricet #3 with Codeine)

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