



MEDTOX[®] Journal

**Public Safety Substance Abuse
Newsletter**

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And the Answer is.....

Unknown

Imagine for a moment a hypothetical drug-testing scenario. In this story, technicians have cued up 100 diagnostic devices for the purpose of screening a large group of people who are on probation. Average positive rates for a population such as this could range from 10% to 25%, but for the purposes of this scenario, 10 out of the 100 screens undertaken rendered positive results. All 10 positive screens were sent to the laboratory for GC/MS confirmation. Each of the 10 screens were rescreened and confirmed as positive. In doing the math, it appears that the diagnostic devices utilized here were 100% accurate in their results. But did this process accurately report the results for the 90 probationers who tested negative here?



Indeed, all 10 of the positive drug screens were confirmed with an alternate technology in the lab. This set of results does suggest that the screening devices were entirely accurate, but, and this is an enormous but, there is little reason to believe that the 90 negative probationer screens are actually negative. These 90 samples were not confirmed as clean, negative samples. In the utilization of rapid screening instruments, people are led to believe by vendors that a negative test result is direct proof that a corresponding donor is clean and free of drugs. However, is that really the case?

MEDTOX processes several million urine samples every year at our St. Paul (MN) laboratories, some interesting statistics emerge from all of that work. For example, 10% of all urine samples that are reported out as negative are actually positive for one or more illegal drugs. These numbers represent the levels of drug use in the workplace setting; results for community corrections, children and family services and rehabilitation are notably higher. In fact, in some juvenile probation settings, positive drug use rates gleaned from random drug screening hover at nearly 40% positive.

There are two major reasons why some donors escape detection and are reported as being clean with what is an otherwise positive drug test. First, some donors have learned to dilute their urine specimens just enough to drive their provided sample below conventional reporting cut-off levels; nearly 55% of all

reported negatives that have actual positive evidence of drug use fit into this category. Second reason revolves around drug use choices of donors; drug users are smart, they know what they're being tested for. With relative ease, otherwise positive donors can switch to an alternative drug, one that acts similar to their drug of choice but one that's not on the list of substances being screened for. Approximately 45% of all reported negatives that are positive are of this type.

When working with public safety and rehabilitation populations, the table below displays numbers for what is the real positive rate for drug use. These numbers are real, they're carefully analyzed and reported by a SAMHSA federally certified laboratory. If a public safety or rehabilitation program's results are not aligned with these numbers, then some serious questions should be asked of the device manufacturer. Obviously, some probation populations will produce statistics that are notably higher than those numbers reported here. Others yet may generate numbers that are lower. Regional drug use trends also influence these numbers. Parts of the country that are impacted by the plague of methamphetamine ("speed," "crank" etc.) abuse will find that the drug will drive up to the top of the list and reflect double digit rates of use. These averages are benchmarks, numbers that readers can compare their own programs against.

THC (marijuana and cannabis products)	9.80%
ETG AND ALCOHOL	7.00%
OPIATES (morphine, codeine, hydrocodone)	2.80%
AMPHETAMINE/METHAMPHETAMINE	2.70%
OXYCODONE (Percocet, Oxycontin)	2.10%
COCAINE	1.90%
BUPENORPHINE (Suboxone, Subutex)	1.10%
BENZODIAZEPINES (Valium, Xanax etc.)	1.00%
METHADONE	0.90%
PROPOXYPHENE (Darvon, Darvocet)	0.40%
BARBITURATES (Fiorinal, butalbital etc.)	0.40%
PCP	0.10%
DILUTED SAMPLES	3.10%

MEDTOX offers services to help clients structure programs that utilize diagnostic screening devices and laboratories for precise drug testing that can provide accurate and honest results. MEDTOX offers packages of urine samples produced in a federally certified SAMHSA laboratory to anyone who would like to investigate if their current drug testing system is reporting the honest truth: clean or not clean?

The winner of the Apple iPod for correctly answering October's Question of the Month was: Craig Leader

There were 806 responses recieved. 26 submitted the correct answer.

Promising Treatment for Difficult Cases of Alcohol Dependency

Over the last decade, physicians have taken to the use of a class of medications that seem to decrease the intensity of alcohol withdrawals and the powerful cravings that are co-occurring. In particular, the neuroleptic medication Neurontin (gabapentin) has demonstrated efficacy in treating alcohol withdrawal and subsequent cravings experienced during rehabilitation. These drugs are used for a variety of different conditions that span treatment of chronic pain to management of seizure disorder. The reports of gabapentin's ability to reduce alcohol symptoms by regulating GABA levels in the brain have been widely discussed. A search for other effective medications to treat alcohol withdrawal and alcohol cravings is ongoing.



Interest has recently focused on the value of a rather obscure benzodiazepine antagonist called Flumazenil. This drug works in a contradictory way to other drugs, such as Valium, Xanax, and Librium. A pioneering group of drug treatment professionals operating as Prometa have proposed the utilization of Flumazenil and gabapentin for sometime now and have been utilizing the drugs in various ways as part of treatment protocols that they promote. The Prometa system is proposed as effective therapy for the treatment of various drug dependencies. The study by Prometa referenced below claims efficacy of Flumazenil and gabapentin for the treatment of alcohol dependency disorders. The combinant value of Flumazenil and gabapentin in treating alcohol withdrawal was recently evaluated in a report published in the Journal of Clinical Pharmacology. The use of Flumazenil in combination with gabapentin appears to be a very promising therapy in treating the alcoholic.[1] But there are some cautionary notes sounded in the research.

This study, although relatively small in terms of study participants, is solid proof (randomized controlled trial) that Flumazenil and gabapentin are effective in treating patients with alcohol dependency. Patients treated with this drug combination exhibited reduced alcohol withdrawal symptoms and significantly higher levels of abstinent behavior as compared to those patients placed in a placebo group (placebo group did not receive the study drugs). But the Flumazenil and gabapentin combination were only effective in the treatment of patients with more severe alcohol withdrawal symptoms. Mild cases of alcohol withdrawal were unexpectedly aggravated at levels of baseline measurements. In other words, the Flumazenil and gabapentin combination should not be used with patients who exhibit just modest or less pronounced levels of alcohol withdrawal and dependency. The challenge for clinicians will be in the assessment of alcoholics seeking treatment with this type of therapy. If alcohol withdrawal severity is not accurately assessed, these medications could bring harm to a patient who is seeking treatment.

For professionals who grapple with the complexities of moderate to moderately severe alcohol withdrawal symptoms, combinant use of Flumazenil and gabapentin have been shown to be effective. Surely, there will be follow-on studies that will explore the confounding discovery that this drug combination exacerbates symptoms in the less dependent. But for now, the publication of this research lends credence to claims made by Prometa regarding the use of these medications in treatment of alcoholism.

Those interested in Prometa information can find it at www.prometainfo.com

[1] Anton RF et al. Efficacy of combination of flumazenil and gabapentin in the treatment of alcohol dependence: Relationship to alcohol withdrawal symptoms. J Clin Psychopharmacology 2009 8: 29:334.

Is Heroin Maintenance More Effective than Methadone Replacement Therapy?

One of the most vexing challenges in treating the addicted is the very high relapse rate for those individuals who have become dependent on opiates. In particular, those addicts who are I.V. users of heroin are some of the most hardened; their relapse rates are noticeably higher than those associated with opiate abusers who don't inject their drugs. In most areas of the country, heroin addicts are routinely treated with a method that's been coined, *opiate replacement therapy*.



In this therapy, methadone is substituted for heroin. Methadone a powerful opiate in its own right; is long acting and can be taken in the form of a liquid and/or a tablet. This substitution process is widely known as methadone maintenance. Harm reduction drives this process. Providing a heroin addict with a long acting drug that suppresses withdrawals and reduces craving is thought to be the best way of keeping him/her from putting a needle into their arm and injecting a crude form of the drug into their bloodstream. HIV and hepatitis are additional concerns here; methadone maintenance helps reduce exposure to these insidious infectious diseases. Complicating these important goals in harm reduction are the challenges faced in keeping heroin addicts in treatment programs, retention rates are notoriously low. At the moment, methadone maintenance is the best treatment available even though drop out rates make it marginally effective at best.

A recently concluded Canadian study evaluated the effectiveness of methadone maintenance compared to "maintenance" undertaken through continued use of injectable heroin. In this controlled scientific study, heroin addicts who were actively seeking treatment were provided with clean needles and pharmaceutical grade heroin for the purpose of self-injection. Addicts received up to three doses of heroin every day, their self-injection of the drug was medically supervised. A separate group of patients were treated with standard methadone maintenance therapy; participants in both groups were randomized into their method of treatment. Arrays of psychosocial services were made available to those who participated in both groups (methadone maintenance and heroin maintenance). By nearly every measurement, the addicts maintained with injected heroin outperformed those who had been maintained with methadone. The retention rates were 88% (heroin) vs. 54% (methadone). Of equal importance was the reduction in illegal drug use and other illegal activities, those numbers reflected a 67% decline for the heroin treated group and 48% for the methadone maintained group. Patients treated with heroin also reported greater and more gratifying social interactions and more stable performances at work. Illegal use of heroin, use of the drug outside the controls of the program dropped significantly as well. There were notably higher incidences of heroin use by methadone maintained patients as compared to those receiving only heroin.

The superiority of injectable heroin over methadone is obvious in the treatment of opiate addiction. But as a practical matter, "heroin maintenance" is a long ways from being an accepted method of drug treatment in the United States. Nevertheless, this study is an important landmark in the process towards developing drug treatment methods that are effective in reining in the bloated rates of relapse and treatment program retention.

Is Spice the Latest Innovation in the Cannabinoid Line of Drugs?

This past summer, the MEDTOX DAR Hotline received many telephone calls about an alleged new form of marijuana called "spice." The majority of the summer Hotline inquiries came from agencies located in New England. Recently however, agencies in California, Kentucky, and Hawaii reported that their communities experienced spice outbreaks. The agencies were curious what the substance was and what the effects were by those who used it. They were unsure if spice abuse was a legitimate cause for concern. For Newsletter staff working on this topic, there was a great deal of Internet misinformation about spice that had to be sorted.



"Spice" is legally sold and typically made of a varying mix of herbs and plant products grounded into a semi-fine potpourri. Spice is sold and marketed as a home aromatic enhancer. Spice has been widely sold and circulated in Europe since 2001. It is legal in Europe. In its ostensibly herbal format, the concoction is also legal in the United States. Although designed by the manufacturer to be used as incense, the majority of spice buyers take to inhaling the aroma from an incense bowl that is packed with the concoction. No one is sure about what is actually in spice at any given moment, but its fans speak of marijuana-like effects when it is inhaled. Some users claim to smoke it, but it's unclear how well the materials burn as there are resins and oily residues in it that makes smoking it a challenge. The claim of marijuana-like effects has garnered spice a great deal of attention throughout various forums on the Internet. The fact that many spice users claim marijuana high (delta 9-THC is the most active cannabinoid in marijuana) suggests that the alleged herbal ingredients in the product may actually consist of cannabinoids. If cannabinoids can be extracted from spice, then the product would fall within the definitions and regulations of the Drug Enforcement Agency (DEA) Schedule I. This schedule consists of drugs that have no recognized medical use in the United States. At present, Schedule I includes drugs such as heroin, L.S.D., and marijuana. Spice's fate as a legally possessed potion turns on whether or not the product contains cannabinoids or cannabinoid derivatives.

The DEA released an advisory related to spice in March of this year. The DEA bulletin announced that a recent U.S. Customs laboratory examination of spice resulted in the discovery of small amounts of a synthetic cannabinoid officially known as HU-210. The concentrations of HU-210 were small, but they were nonetheless detectable in the product that underwent examination. HU-210 is a difficult substance to detect. Specialized laboratory instruments and procedures are needed to identify and extract it. HU-210 is a synthetic substance. The substance is manufactured in laboratories and is chemically structured to mimic the actions of delta 9 THC. Research has clearly established that HU-210 is powerfully active at both CB1 and CB2 cannabinoid receptors in the brain. Stimulating action at these two cannabinoid receptors are what propels the pleasurable effects associated with the use of marijuana. HU-210 has research laboratory applications, but it is strictly regulated under DEA Schedule I.

It remains to be seen if other spice products in the United States actually contain HU-210. A quick Internet trip can connect you with spice products such as "Spice Diamond," "Lunar Diamond," "Spice Gold," "Spice Silver," "Spice Girl," and "Yucatan Fire." Although stamped and sold as incense, the interest in spice is probably unrelated to its aroma. Someone who inhales or smokes HU-210 laced spice will likely exhibit typical marijuana effects. DAR and DRE trained personnel should expect a range of direct effects found within the rubric of cannabis signs and symptoms. The expression of cannabis effects

are dose dependent.

Users of spice products have posted their experiences and evaluations on the Internet. Reading these postings, it becomes clear that inhaling spice can sometimes bring about distinct hallucinogenic effects. Spice fans report that inhaling the fragrance of the exposed contents can bring about a high that is similar to that obtained by smoking salvia divinorum. Readers should not be surprised that spice dealers and outlets also offer salvia to their shoppers. Salvia is a mild hallucinogen that is legal to possess. At the moment, it is not a controlled substance. Spice products come in varying strengths. Some of the more potent spice products have price tags of close to \$500. For that money, a customer gets a small bowl of potpourri that promises to brighten up the mood and ambience of any targeted room in the home.

At the present time, spice does not represent a significant drug abuse threat. The extent to which spice that is widely laced with HU-210 is not known. But other nefarious abused drugs got their starts as synthetic add-ons to otherwise legal and innocuous substances. The DAR Program and the staff of the DAR Newsletter will monitor the spice phenomenon and will report further developments that warrant attention of our readers.

Readers needing assistance with HU-210 testing and evaluation can contact the DAR Program at: DARSProgram@mac.com

The Expert's Corner: Making the Most of Your Instant Drug Screening Device

Periodically, the DAR Newsletter invites expert guest writers to address difficult challenges that readers face in their work on the front lines of rehabilitation, community corrections, and drug enforcement. This edition offers an essay written by a scientist who assists users of instant drug screening devices in the proper utilization and interpretation of their instruments. The writer addresses very important but widely misunderstood characteristics of instant devices, sometimes referred to as "point of collection" drug test kits. Readers who use these tools in the course of their professional duties will find this essay to be informative and helpful towards their proper and effective utilization. Mr. David Breutzman, MEDTOX Scientific, Inc. St. Paul (MN) writes this essay.



As a technical support specialist, I have dealt with all types of issues that customers have had with their instant test products. Complaints vary from claims that a lone device is not working or is defective, to comments that a user received a bad lot number of an affected product. Common causes associated with underperforming or non-performing devices include a product defect occurring at some stage of manufacture, product damage during shipment, improper storage of a device following receipt from shipping, utilization of previously refrigerated urine samples before they have warmed up to room temperature, utilization of chilled devices before they have had time to warm up to room temperature, and incomplete or procedural errors committed by a device operator. In my experiences, the most common cause for claims of a failed device is operator error in reading and following the instructions.

As an aside, I deal with periodic assertions of failed lots, or if you will, large batch malfunction. Blemished or poor performing batches of devices are a phenomenon that is aggressively managed before

any lot number of product is released for sale. Screening devices have gone through extensive testing during formulation, manufacturing, and post manufacturing life cycles. During these processes, hundreds of instant screening devices are evaluated to insure proper performance. A lot number that fails to meet the muster of quality assessment and proof of performance will not be released for sale. When a product leaves a manufacturer's facility, that product should continue to meet its performance specifications right up to its posted expiration date. Damage to a product during shipping, inappropriate storage, or procedural errors committed at the point of testing can make all the special quality control work done back at the manufacturer's laboratory meaningless.

I would like to offer readers the following general recommendations for making the very best use of an instant drug-screening product:

1. *Read, understand, and follow the instructions and cautions outlined in the product insert that's included in the box.*

2. *Properly store and manage the temperature range for your screening devices*. Extended exposure to heat will eventually lead to total test failure.

3. *Insure that temperature of the urine to be tested and the test device are at or near room temperature.* Refrigerated urine is too cold to use for most screening tests. Driving this recommendation is the fact the chemical reaction in a screening device is very temperature dependent. If reacting components are cold, their slowed reactions will result in the delay of test line formation.

4. *Don't add or otherwise involve the use of preservative in a urine sample.* Most screening tests require urine specimens to be free of preservatives, adulterants, or other unnatural components. Added chemicals to the urine can cause unexpected results or initiate complete test failure because they interfere with the chemical reactions of substances arrayed on a test strip.

5. *No more, no less:*

follow instructions for the proper amount or level of urine that your device requires.

Overfills and under-fills with urine can wipe out a screening test's performance. Problems associated with urine volume can lead to unwanted results, light lines being just one of them. Users of "dip" style devices need to adhere to instructions about how deep and how long the exposed strips should penetrate a urine sample. Most dip devices have clear instructions for their proper use and interpretation of results.

6. Interpret your drug screening test results at the appropriate read time.

Using a kitchen timer is helpful in keeping track of time. Reading screening results too soon may result in faint lines that are hard to read. This situation may give rise to an operator claim that a result is a false positive because the test line in question hasn't had sufficient time to develop. Most devices have a limited read time window. Manufacturers typically caution users to disregard results collected outside their certified time span or read time.

7. Interpret screening results as per the manufacturer's instructions

. Sounds like an easy thing to do right? But this admonition is often ignored or misunderstood. For screening systems where the development of a dark line indicates a negative result, the color, boldness, or intensity of a line is relatively meaningless. The presence of any line, no matter how light it may be, is a direct expression of a NEGATIVE test result. There are no quantitative assessments that should be drawn from a line's intensity. From use of prescription and over-the-counter medications to the actions of endogenous enzymes present in a donor's system, there are a variety of cross-impacting factors that can affect the visual intensity of a test line.

8. Confirm presumptive positive results by an alternate methodology, such as gas chromatography and mass spectrometry (GC/MS or alternatively LC/MS/MS).

This specialized analysis should be conducted at a qualified reference laboratory when screening results do not fit with a sample donor's medical history or when the screening results are questioned by a party having stake in the process. Repeating a drug screen with a second or third screening device does NOT result in confirmation. Screening device results cannot confirm one another. Confirmation testing is the only way to reach an incontrovertible or undeniable result. GC/MS confirmations (and other like processes) are

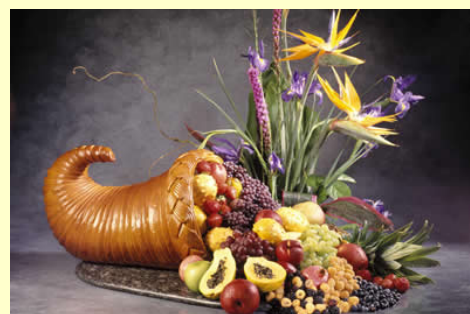
considered the gold standard for accuracy and reliability of results in drug testing.

Training personnel in the use of instant test devices is a critical step towards obtaining accurate results. Without proper training and certification of personnel, confusion in the proper utilization of screening devices can lead to questionable results, frequent calls to help lines, and an overall loss of confidence in the process.

If you would like additional information about troubleshooting problems in drug testing, an expanded treatise on this subject can be obtained by emailing lmize@medtox.com

Name that Drug: Nausea News

At the core of this month's subject is a substance that lies at the heart of drug control policy in America. For humans, there is probably no other condition more painful and miserable than nausea. Attendant to nausea is emesis (vomiting). An entire class of medications has arisen to deal with this phenomenon. The genre of drugs is called antiemetics. Pharmaceutical researchers have searched for an improved antiemetic for decades. Over-the-counter options for this type of medication are limited. The most effective options are compounds that involve the utilization of meclizine. For travelers, especially seagoing travelers, meclizine is very effective in eliminating symptoms of seasickness and vertigo. However, this month's drug is not meclizine, nor is it an antihistamine.



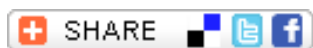
This controlled substance is regulated under Drug Enforcement Agency (DEA) Schedule III. First isolated by scientists in 1964, the drug is relatively young compared to other drugs discussed in this column. Thought not capable of causing a drug dependency, there are scattered reports of some users who have become addicted to it. This drug is a synthetic substance (a drug manufactured by a pharmaceutical company under laboratory circumstances.) The drug is delivered in capsule or nasal spray. The drug's actions in the central nervous system involve coupling with a set of receptors widely known as CB1 and CB2. The pharmacology of the drug is complex as it involves a connected network of transmitters and receptors associated with dopamine and endorphin (enkephalen-opioid receptor network). The human brain contains endogenous forms of the drug, substances that are naturally produced in the body. Through the interconnections of CB1 and CB2 with other neurotransmitter systems, the drug has notable effects as an antiemetic. Although its potency and effectiveness as an antiemetic are still widely debated, the drug is used as a fallback for patients where standard anti-nausea medications have failed.

Newly fashioned drugs with more antiemetic properties have now come to market. Zofran (ondansetron) and Reglan (metoclopramide) are examples. This month's drug has taken a back seat to these more effective medications. But the discussion doesn't end there. This month's drug can be found in a natural form in plant form, too. The difference between the plant form and the synthetic form of the drug is minimal. A large lobby has evolved for the advocacy of the plant-based material as a treatment for nausea and also as a tonic for nearly every malady known to man. Incidentally, the primary delivery system for the plant-based drug is to smoke it.

By now, readers should know that this month's drug is Marinol (dronabinol), a synthetic form of delta-9 THC. The drug is a member of the 400+ substances that are known as cannabinoids. The drug is infrequently prescribed, but is periodically used as an alibi for people who have been drug tested and found positive for marijuana (THC). With medical marijuana taking front stage in states throughout the country, prescriptions for Marinol are rarely needed anymore to explain away a positive marijuana drug test. A medical marijuana note can achieve the same result. For those interested, there is a drug test that can distinguish between a positive test triggered by marijuana smoking as opposed to legitimate use of Marinol capsules.

The matter of THC as medicine continues to dominate public policy debate in America. Recent positions by some medical societies have fanned these flames further. Discussions about marijuana will rage on. But the utility of Marinol and its value as an antiemetic are undisputed. Marinol is a moderately effective medication for cases of nausea and vomiting that are unresponsive to other therapeutic options.

Drug of the month: Marinol (dronabinol, nabilone)



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