Greetings!

Thank you for subscribing to the MEDTOX Journal. We hope you find this newsletter interesting and educational. In addition to this month’s mystery drug article, this issue focuses on the new synthetic drug of concern, the latest research on alcohol and the fruit fly, and the latest trends of the substance abuse by teens. Also, make sure to look for the special savings opportunity at the end of the Journal.

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Carisoprodol (Soma) Finally Assigned DEA Scheduling (IV) and Control

For quite some time, law enforcement and substance abuse professionals have railed about the lack of DEA control over the muscle relaxant carisoprodol. Widely known by its brand name Soma, carisoprodol has become a popularly abused sedative, a drug that is regularly combined with prescription opiates to create drug super-cocktails. The DEA Schedule IV classification puts carisoprodol in one of the less-restrictive classifications, but nevertheless provides law enforcement authorities with new tools that can be used to...
Carisoprodol is a skeletal muscle relaxant that is very closely related to the central nervous system relaxant, meprobamate. Once it enters the bloodstream, carisoprodol is essentially metabolized into meprobamate. For decades, meprobamate was a widely distributed drug used to treat anxiety, muscle spasm, and insomnia. Sold under brand names of Miltown and Equagesic, meprobamate was once one of the most widely utilized prescription sedatives in the world. But the emergence of the benzodiazepines and fallout from several incidents with fatal adverse effects, meprobamate sales have fallen off dramatically. At present, the best known meprobamate product is carisoprodol.

Soma in brand and generic forms is a 350 mg single scored, round tablet. A related product, Soma Compound, contains the main ingredient of carisoprodol in combination with codeine and aspirin. This product is not prescribed often and does not appear to be much of a public safety or diversion threat. Ironically, carisoprodol does not appear to directly relax spastic skeletal muscle. Several well-constructed studies have revealed that the muscle relaxation that occurs with the use of the drug seems to be tied to its sedative effects. As a patient becomes more sedate, the more likely that an underlying spastic condition will relax. The same physiological response seems to occur with the use of diazepam (Valium) and lorazepam (Ativan). Someone using Soma for extended periods of time faces the likely development of tolerance and dependency. Many Soma addicts claim the dependency, "snuck up and bit them".

The most popular "load" or "combo" involving Soma is the partnering of carisoprodol and hydrocodone. Called "Somadin" or "Somadone," carisoprodol enhances the effect of hydrocodone and creates a more intense and longer acting euphoria. A typical "Somadone" load involves 600 mg of Soma and 10-15 mg of hydrocodone. Tolerant users may take up to 1050 mg of carisoprodol and 20 mg of hydrocodone at one sitting. More provocative users will combine the drug with oxycodone, perhaps by smoking the combined contents of Percocet and Soma tablets.

Someone who has ingested Soma may exhibit noticeable symptoms of intoxication. This usually will not happen unless a user has ingested more than one tablet. Physical symptoms of inebriation are typically unnoticeable unless an unordinary amount of the drug is aboard. Use of alcohol with Soma is dangerous. Synergy exists when the two drugs are combined. That means that the resulting intoxicating effect is logarithmic, in other words, 1 plus 1 equals 3, 4, 5 or 10. Physical signs and symptoms of Soma intoxication will closely mimic those of alcohol, save for the tell-tale odor. Nystagmus and lack of convergence will be present, speech may be slow and possibly a little slurred. Droopy eyelids, slow internal clock, and an uneven gait may also be present. These effects may last for 3-5 hours depending on tolerance and the amount of the drug ingested.

Carisoprodol (Soma) use can only be detected by drug tests that are specifically designed to pick it up. Panels for barbiturates and opiates will not cross react with samples containing the drug or its metabolites.

Additional questions regarding carisoprodol (Soma) can be directed to MEDTOX DAR personnel working for the DAR Journal.

"Pump-It Powder" Emerges as Latest Synthetic Drug of Concern
First there was K2 (Spice) and the slew of synthetic cannabinoids. Then came bath salts; they were new and they were legal. These drugs were available and sold as over-the-counter products in an international web-based marketplace. Many of them were sold in head shops and medical marijuana clinics in the United States. But now these synthetics are all banned, well, most of them anyway. But into the fray now comes "Pump-It Powder," an "enhanced plant vitamin." It's the latest synthetic drug to be manufactured and sold under the ruse of a substance, "not intended for human consumption."

With myriad bath salts and plant food products available in the marketplace, uncertainty already reigns. No one quite knows what is in these synthetics. The Internet is full of supposition, but it is not clear at all what manufacturers are putting into their final products. Nevertheless, a great deal of discussion has centered on the role of geranamine as primary constituent of Pump-It. Geranamine is also known as methylhexanamine, an old-time amphetamine-related stimulant and decongestant that is found naturally in the geranium plant, hence its name. Methylhexanamine is a legal substance; it is not scheduled by the DEA. The drug has not been widely studied. It was patented in 1944 and for the most part has been dormant since that time. But in the world of energy drinks and aphrodisiac potions, methylhexanamine has been a prime player. Users of Pump-It have flooded Internet message boards with questions and stories about the product. It is the users who we should turn to for expert opinion. From what our MEDTOX DAR instructor-experts can determine, Pump-It Powder indeed performs in a way that is similar to those effects that would be expected with the use of methylhexanamine. But, then again, many users purport the drug to be quite similar to pre-ban bath salts that contained MDPV. Many in fact report that Pump It powder has become an addictive routine.

We do know that emergency rooms have begun to feel the sting of Pump-It Powder. Patients have reported to the emergency rooms having suffered seizures, hallucinations, and paranoia. Users report to physicians that they are experiencing effects that are similar, but more powerful than, cocaine and methamphetamine. The drug appears to have a regional appeal. Pump-It Powder is popular in the Midwest and plains states. It does not have a great following on the Pacific Coast, yet. It can be found on the Internet, but more alarmingly is the fact that it is available as an over-the-counter product in gas stations and novelty stores.

Of great concern is the potential effect that this drug has on teenagers. It is easy to find and it is relatively cheap, $30 for a tin container packed with the powder. The drug can be snorted or "bumped," injected, or smoked. Of additional concern is that the onset of this drug's high is somewhat delayed. This situation then prompts users to "bump" a double or triple dose because the onset of effects is not felt right away. Those actions then lead to absorption of a hyper dose and the experience of grossly exaggerated effects and a likely trip to the hospital.

Like bath salts, a Pump-It Powder high will trigger DAR signs and symptoms that are consistent with both central nervous system stimulants and hallucinogens. Heart rate, body temperature, and the internal clock will all be accelerated. The pupils will dilate and may exhibit sluggishness in response to direct light. There may be piloerection (gooseflesh) and user claims of sensory distortions. Users may exhibit behaviors of gross paranoia. The high will last for 4-6 hours, although some users claim that they were held "high" for 12 hours and longer. The symptoms appear to be dose dependent.
Alcohol and Fruit Flies: A Drink a Day Keeps the Bad Bugs Away?

On a lighter reporting note, the Journal recently discovered the results of an interesting study that grappled with the effects of alcohol (ethanol) on the activity of drosophila melanogaster, the ubiquitous fruit fly. Many readers have no doubt spent quite some time studying these little creatures as they are the perfect vehicle for all sorts of lab studies into genetics and microbiology. The numbers of fruit fly studies grow daily. One recently concluded investigation revealed an interesting relationship between the fruit fly, ethanol, and the drosophila's most feared adversary, the wasp. See, wasps lay their eggs in fruit fly larvae to begin with. Young wasps are hatched and then live as parasites sucking down the blood of their fruit fly host. The wasp lives as a parasite off of an ever-weakening drosophila, ultimately killing it. But it seems the fruit fly has learned how to fight back.

In the February 16 (2012) edition of Current Biology, there is evidence that alcohol in the fruit fly circulatory system may be the insects' way of fighting the blood sucking of the wasp. By living off decomposing fruit, the fruit fly is constantly rummaging around with the elements needed to make alcohol. Many of the fruit items they visit have alcohol in them, so fruit fly meals often are loaded with alcohol. It appears that flies loaded on booze presented with far fewer parasitic wasps aboard than those that did not imbibe. Scientists asserted that the fruit flies were drinking purposefully. That they had some awareness that they were under assault from their wasp parasite and they took to self-medicating with alcohol to eradicate them. Researchers ran experiments that allowed participating drosophila to choose to eat from a Petri dish that on one side was rich in alcohol or from the other side that was free of it. In 80% of the cases documented, wasp-infected fruit flies chose to eat from the alcohol-saturated food source. It appears that the flies deliberately chose the alcohol laced substrate. The alcohol of course proved deadly to the wasp parasite. Wasps can not handle their alcohol like fruit flies; they die off when they get intoxicated.

So even at some of the less complex forms of life, self-medication is a fact of life. Humans certainly do it. Alcohol has become a medication for all kinds of emotional insults. Could it be that there are internal parasites or bugs that populate our circulatory system that alcohol use keeps in check and prevents proliferation? Do we have the equivalent of the fruit fly's wasp parasite to contend with? Not likely. But that will not keep some imbibers from trying to use it as an excuse for "bartender, can I have just one more?"

February 2012 Mystery Drug: A Drug of Humble Origins Holds Great Promise as Therapy for the Addicted and the Afflicted
The regular column Name that Drug essay remains a popular feature of the DARS Journal. Our writers are sometimes vexed however with the challenge of coming up with new substances and compounds that will capture reader interest and attention. This month’s subject drug is one of the more intriguing that has appeared in this column of late. This month's drug is a therapeutic breakthrough in several different fields of medicine and pharmacy. Unlike nearly all its brethren who have been featured in this column, it is not a drug of abuse; it is not a controlled substance. How is it relevant to the discussions of this Journal if this drug has no potential for abuse? The answer to that question is a major clue towards its final identification.

This month's drug is a substituted oxymorphine molecule; it is the N-cyclopropylmethyl derivative of oxymorphone. Does this clue help? Probably not, so let us push on with the discussion of this drug's potential as pharmaceutical therapy in the treatment of addictive disease. When utilized as a medication for the treatment of substance abuse disorders, the drug is quite effective. In fact, the fame and success that this month's drug has garnered in the treatment of addictive disorders has served as a catalyst towards an overall understanding of the precise nature of addictive disease. The unique pharmacological properties of the drug have helped scientists and researchers understand how all drugs of abuse function as intoxicating agents in the human central nervous system.

Take for instance, alcohol dependence and abuse. This month’s drug is approved for use in reducing the frequency and intensity of drinking relapse. This is a bit of an odd development considering that the drug is an opiate receptor antagonist. But in a unique and special format developed for use in treating alcohol dependency, the drug provides extended, long-acting reductions in the cravings that undermine the resolve of recovering alcoholics to stay sober. The drug appears to be well tolerated. Of interest is that a subset of recovering alcoholics who possess a unique variant of a gene that determines opioid receptor activity appear to do unusually while undergoing therapy with this drug. A series of studies conducted to more fully consider the effectiveness of the drug have sometimes yielded conflicting results. Sometimes, especially when its oral format is utilized, its effects have been not much better than placebo. In other studies, the drug appears to have been a noticeably effective agent in reducing relapse and a return to heavy drug (or alcohol) use. At the moment, the drug is approved as a prescription medicine in treating alcoholism.

In a popular extended release format, this drug is injected intramuscularly once a month into a patient's lower extremity. This formula appears to be the most commonly prescribed form of the drug. In addition to treatment of alcoholism and alcoholic cravings, the drug is also approved to aid in the prevention of relapse to opioid dependence. As an opioid receptor antagonist, the drug would seem to be a natural therapeutic choice for treating opiate cravings right? And towards this end, it seems to be quite effective. Especially in populations of addicts who are being monitored in the criminal justice system. Of particular relevance to the criminal justice is the fact that once injected into the musculature, the drug is irretrievable. A patient at that point must be medication compliant; there is no way for a patient to stop taking the drug in order to facilitate relapse to opiate abuse. In its oral form, a patient just need not take his or her daily dose in order to avoid the drug's opiate receptor blocking effects. In the depot-injection form, the patient surrenders to a controlled release of the drug.

This month's drug is frequently confused with a related substance called naloxone. It is not naloxone, although this month's drug does exhibit the same biochemical
features. Narcan is the brand name that is prominently associated with naloxone; it is the go-to drug for reversal of over dosage in cases of opiate intoxication (heroin, oxycodone, and methadone). Patients unconscious and in extremis from opiate intoxication can be instantly reversed by way of naloxone's actions. This month's drug features some similar characteristics at opiate receptor sites in that it does render them "blocked", but it does not possess the full-throated antagonistic and reversing effects that naloxone does.

One of the other uses for this month's drug is in the treatment of dependencies to cocaine and methamphetamine. Although these applications are in various phases of official evaluation, there appears to be some hints that this month's drug may be effective in reducing the cravings to relapse in abstinent cocaine and methamphetamine users. Here, the inter-relationships of opiate and dopamine receptors seem to be the nuance that fuels (or reduces) the frequency and intensity of cravings and severity of relapse. Further off-label use of the drug suggests that there may be further applications for this drug in cases of impulse control disorders (compulsive gambling and stealing) and perhaps some types of immune system disorders.

All in all, this month's mystery drug is indeed just that. Its role as an antagonist of opiate receptors has been well studied and thoroughly evaluated. But what makes it mysterious is that this opiate-related drug influences monoamine transporter systems that influence the vital central nervous system transmitter dopamine. Dopamine is after all the central player in the highs caused by use and abuse of most euphoria-producing drugs. The future will no doubt see the scientific exploration of these connections and hopefully reveal the exact nature of the chemical wiring that underlies the difficult process of recovery and sobriety. We must stay tuned.

Click Here for this month's mystery drug.

For those who are unable to open the link, email medtoxjournal@medtox.com for the answer.

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**Nutmeg Associated with Hallucinogenic Experiences**

Nutmeg, a widely used spice found in eggnog, mulled cider, and some baked goods, is comprised of compounds that are capable of triggering hallucinogenic effects when ingested in a concentrated dose. The chemical in nutmeg that can cause these effects is called *myristicin*. It is present in nutmeg in relatively small quantities, but to the devoted hallucinogen fan, there is enough to get high. To elicit the hallucinogenic high, a user will be forced to eat several spoonfuls of nutmeg, and that much nutmeg is likely to cause the gastrointestinal tract some serious grief. In several ways, nutmeg is much like the hallucinogenic shrub, Jimson weed. And Jimson weed is a known killer, a very dangerous recreational drug. And although Jimson weed and nutmeg exert similar actions on the central nervous system, Jimson weed is more dangerous, hands down.

Social media is a potent driver of teenage drug use trends these days. Nutmeg now rides the wave of social media rumors and speculation. The nutmeg high is unlike other herbal and spice highs. Although it is likened to LSD, the nutmeg-caused "high" is qualitatively different. The hallucinogenic effects can persist for several days. In fact, it is the length of the nutmeg high that causes most concern to medical experts. Regional poison control centers have seen a spike in calls associated with nutmeg
abuse this year. Nutmeg has become the adolescent flavor of the month drug, another household product that teenagers have researched and found to be "trippy." Riding the coattails of Spice and bath salts, nutmeg is a legal, affordable means of getting a hallucinogenic trip. But the nutmeg experience may turn out to be an ugly one.

Like all hallucinogenic drugs, myristicin confuses sensory inputs. Lights become sounds, sounds become tastes. And to that extent, the nutmeg high is typically hallucinogenic. But the experience does not stop there. Preceding the hallucinogenic effects, in a manner quite similar to the effects caused by peyote, users experience rather severe nausea and vomiting. The heart rate soars, the pupils dilate, body temperature climbs, and the lower gastrointestinal tract becomes spastic. The hallucinogenic trip quickly turns sour. But the symptoms persist. For many, the first nutmeg trip taken is also their last one.

Experimentation with nutmeg is probably a passing fancy. But it is important to be aware of this spice's potential for abuse, especially in susceptible populations such as adolescents and young adults. Be sensitive to the symptoms described above; someone who has experimented with this drug will likely be in need of help.

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