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## Molly: The Not So Convincing Truth of MDMA

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## **Molly: The Not So Convincing Truth of MDMA**

Alison Cromer

Molly. XTC. E. Adam. Or simply MDMA. No matter what the name, 3,4-methylenedioxy-methamphetamine has made its way into the mainstream media over the last 20 years, taking over the club and nightlife scene in a wave of warm fuzzy thoughts. Following in its footsteps, the rumors of depression, brain damage, and death have lurked in the shadows, scaring off anyone who has a 'decent' amount of common sense. However, these rumors are just that- rumors. The truth is, the long held stigmas about MDMA have little support through scientific evidence and the opposite may in fact be true- MDMA should not be a schedule 1 drug for it fails to show brain damage that cannot be protected again or prevented, addictive properties, and shows promising therapeutic application in psychotherapy.

The facts are this: MDMA was born out of the German pharmaceutical company Merck and Co., whose primary goal was to synthesize different pharmaceutical compounds (6). In the 1970's, MDMA made its way to the United States and took up residence in psychotherapy practices across the nation (6). It wasn't until the turn of the century that the Food and Drug Administration began minor tests on the compound to start the process for approval for medical use. The hope was that MDMA would be able to combat a host of psychotherapeutic issue including anxiety and PTSD. Earning itself the name "penicillin for the soul," MDMA was on the fast track to fame and fortune (6). In the late 1980's, MDMA took a side trip to the streets. The testing by the FDA had proven inconclusive and Drug Enforcement Agency (DEA) labeled the compound as a Schedule 1 Drug: a substance that has high abuse potential and no medical benefits (4).

The effects of the drug are labeled as a psychoactive stimulant similar to amphetamines and on occasion a hallucinogen similar to LSD (1). On a chemical level, MDMA causes primarily serotonin, but also dopamine and norepinephrine, to rush out of the brain cells, giving a feeling of euphoria (3). Users of MDMA have reported increased feeling of well being, emotional openness, and energy while under the influence (1). The experience of being on MDMA has earned the nickname "rolling" for the wave of high that a user feels (7). Yet, for the amazing high, users also feel an extreme low marked by depression, anxiety, sleep abnormality and minor confusion (3). The low can be felt for several days after dosing, a time period in which the brain recovers from the high and reestablished proper levels of serotonin and other neurotransmitters.

One of the most terrifying and most discussed about topics surrounding the use of MDMA is the effect users suffer after prolonged use. Chronic abuse has shown neurotoxicity that had lead to the depletion of serotonin structures in the brain, creating "holes" in the gray matter (2). Chronic depression, memory loss, addiction and even death are supposed marked traits of MDMA abusers (3). The after math of MDMA has been noted to take up to seven years to see substantial regrowth in damaged areas of the brain (2). These traits are what MDMA is known for: the extreme high and the even more extreme low. Ever since it's creation, this bad reputation has plagued MDMA.

However, when looking even more closely at the studies, imperfections began to shine through. As for the addiction that is implied through the labeling of MDMA as a schedule 1 drug, there is little support to prove that MDMA is an addictive substance. It

is argued that the side effects, including blurred vision, sweating and muscle tightness, are actually deterrents of physical addiction (4). Psychological addiction is more of a gray area, however. The modern belief of psychopharmacology is that psychological addiction lies within the user rather than the substance (4). Thus taking away one criteria needed to place MDMA as a schedule 1 drug.

Furthermore, MDMA has been used successfully in several psychotherapeutic applications. Patients are prescribed MDMA are taken daily in order to tackle specific issues which are later addressed in therapy. The emotional openness, confidence, sense of self, and willingness to forgive that is felt while on MDMA has improved patients who have battled with low self esteem, poor communication skills, and anxiety disorders (4). No other substance has lead patients to break away from their issues and look at themselves with a rational frame of mind (4). Paired with the lack of addictive nature, the therapeutic effects of MDMA completely exclude the substance from being a schedule 1 drug.

Aside from the improper labeling of MDMA, studies focusing on the long-term effects of MDMA have been misconstrued to fit the bill. Studies supported by the National Institute of Health showed great support for neural damage and the notion that even after years of abstinence, neural plasticity will have done little in the ways of repairing the damage done by MDMA (2). The catch, however, is that some of the most convincing work on neural plasticity were done on monkey test subjects opposed to humans (2). In human subjects, use of MDMA alone has failed to show significant damage done to the brain when used in moderation (3). If damage is done, it is most likely due to use of MDMA in coalition with other substances such as ketamine, cocaine, and other amphetamines (3).

In the last few years, users of MDMA have also taken up the habit of “pre-loading” and “post-loading” before and after the ingestion of MDMA (5). Since MDMA works on a cellular level in the brain, pre and post loading are used to control the affects of MDMA through the use of vitamins and supplements. One popular preloading supplement is 5-HTP, which directly influences the production of serotonin (5). 5-HTP is taken anywhere between a day to a few hours before dosing on MDMA to create high levels of serotonin which will create a more powerful high when the serotonin is released (5). Magnesium can also be taken to prevent the clenching of the jaw commonly associated with MDMA use (5). Post-loading practices may include taking additional 5-HTP and SSRI’s in order to reestablish the reservoirs of serotonin in the brain cells as well as prevent reuptake of serotonin, which effectively lowers serotonin production (5). Though studies on these techniques are still in their infant stages, users who pre/post load testify the impact such practices make on the come down and after affects of MDMA use.

All in all, MDMA has retained a bad reputation for far too long with little evidence to support it. Though damage and addiction are possible, only in extreme cases can they be seen. Even minor, more immediate effects of MDMA have the potential to be combatted. Also, MDMA offers a promising impact in the field of psychotherapy. With the current increase of cases of PTSD and anxiety disorders, a powerful substance like MDMA could greatly improve the quality of life for many people. If nothing else, MDMA needs to be reevaluated through unbiased eyes and recognized for its true power.

## References

1. National Institute on Drug Abuse. (2012), Drug Facts: MDMA. <http://www.drugabuse.gov/publications/drugfacts/mdma-ecstasy>.
2. National Institute on Drug Abuse. (2007), The Neurobiology of MDMA (Ecstasy). <http://www.drugabuse.gov/publications/teaching-packets/neurobiology-ecstasy/section-iii/3-long-term-effects-in-monkeys>.
3. Colado, M. Isabel, O'shea, Esther, and Green, Richard A. (2004), Acute and Long Term Effects of MDMA on Cerebral Biochemistry and Function. *Psychopharmacology* 2004 173: 249-263 doi 10.1007/s00213-004-1788-8.
4. June E. Riedlinger (1985): The Scheduling of MDMA: A Pharmacist's Perspective, *Journal of Psychoactive Drugs*, 17:3, 167-171
5. Brian C. Kelly (2009): Mediating MDMA-Related Harm: Preloading and Post-loading Among EcstasyUsing Youth, *Journal of Psychoactive Drugs*, 41:1, 19-26
6. National Institute on Drug Abuse. (2006), MDMA (Ectsay) Abuse: A Brief History of MDMA. <http://www.drugabuse.gov/publications/research-reports/mdma-ecstasy-abuse/brief-history-mdma>
7. Urban Dictionary. (2013), Rolling. <http://www.urbandictionary.com/define.php?term=rolling>