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# MDMA (Ecstasy)

MDMA (3-4 methylenedioxymethamphetamine) is a synthetic, psychoactive drug chemically similar to the stimulant methamphetamine and the hallucinogen mescaline. Street names for MDMA include Ecstasy, Adam, XTC, hug, beans, and love drug. In 2002, an estimated 676,000 people in the U.S. age 12 and older used MDMA.*

Research in animals indicates that MDMA is neurotoxic; whether or not this is also true in humans is currently an area of intense investigation. MDMA can also be dangerous to health and, on rare occasions, lethal.

MDMA exerts its primary effects in the brain on neurons that use the chemical serotonin to communicate with other neurons. The serotonin system plays an important role in regulating mood, aggression, sexual activity, sleep, and sensitivity to pain.

## Health Hazards

### Cognitive Effects

Chronic users of MDMA perform more poorly than nonusers on certain types of cognitive or memory tasks. Some of these effects may be due to the use of other drugs in combination with MDMA, among other factors.

### Physical Effects

In high doses, MDMA can interfere with the body's ability to regulate temperature. This can lead to a sharp increase in body temperature (hyperthermia), resulting in liver, kidney, and cardiovascular system failure.

Because MDMA can interfere with its own metabolism (breakdown within the body), potentially harmful levels can be reached by repeated drug use within short intervals.

Users of MDMA face many of the same risks as users of other stimulants such as cocaine and amphetamines. These include increases in heart rate and blood pressure, a special risk for people with circulatory problems or heart disease, and other symptoms such as muscle tension, involuntary teeth clenching, nausea, blurred vision, faintness, and chills or sweating.

### Psychological Effects

These can include confusion, depression, sleep problems, drug craving, and severe anxiety. These problems can occur during and sometimes days or weeks after taking MDMA.

#### Neurotoxicity

Research in animals links MDMA exposure to long-term damage to neurons

that are involved in mood, thinking, and judgment. A study in nonhuman primates showed that exposure to MDMA for only 4 days caused damage to serotonin nerve terminals that was evident 6 to 7 years later. While similar neurotoxicity has not been definitively shown in humans, the wealth of animal research indicating MDMA's damaging properties suggests that MDMA is not a safe drug for human consumption.

### *Hidden Risk: Drug Purity*

Other drugs chemically similar to MDMA, such as MDA (methylenedioxyamphetamine, the parent drug of MDMA) and PMA (paramethoxyamphetamine, associated with fatalities in the U.S. and Australia) are sometimes sold as ecstasy. These drugs can be neurotoxic or create additional health risks to the user. Also, ecstasy tablets may contain other substances in addition to MDMA, such as ephedrine (a stimulant); dextromethorphan (DXM, a cough suppressant that has PCP-like effects at high doses); ketamine (an anesthetic used mostly by veterinarians that also has PCP-like effects); caffeine; cocaine; and methamphetamine. While the combination of MDMA with one or more of these drugs may be inherently dangerous, users might also combine them with substances such as marijuana and alcohol, putting themselves at further physical risk.

## *Extent of Use*

### *Community Epidemiology Work Group (CEWG)***

CEWG members monitor drug use data sources for 21 metropolitan areas nationwide. In many of these areas monitored by CEWG members, MDMA, once used primarily at dance clubs, raves, and college scenes, is being used in a number of other social settings.

The number of MDMA emergency department (ED) mentions decreased in 11 CEWG areas from the first and/or second half of 2001 to the first half of 2002, with a significant increase reported only in New Orleans. The highest numbers of MDMA ED mentions in the 2002 period were in Philadelphia, Miami, San Francisco, Atlanta, Los Angeles, and New York.

### *2003 Monitoring the Future Survey (MTF)****

MDMA use decreased in each grade, continuing the decline that began in 2002. Past year use among 8th-graders decreased from 2.9 percent to 2.1 percent; from 4.9 percent to 3.0 percent among 10th-graders; and from 7.4 to 4.5 percent among 12th-graders.

For more information, please visit **www.ClubDrugs.org** and **www.Teens.drugabuse.gov.**

*The 2002 National Survey on Drug Use and Health (NSDUH), produced by DHHS's Substance Abuse and Mental Health Services Administration, creates a new baseline for future national drug use trends. The survey is based on interviews with 68,126 respondents who were interviewed in their homes. The interviews represent 98 percent of the U.S. population age 12 and older. Not included in the survey are persons in the active military, in prisons, or other institutionalized populations, or who are homeless. Findings from the 2002 NSDUH are available online at www.DrugAbuseStatistics.samhsa.gov.

**CEWG researchers meet twice yearly to share emerging trends in drug abuse for 21 major U.S. metropolitan areas. This report was based on data published in the CEWG Advance Report for June 2003. CEWG reports are on NIDA's Web site at www.drugabuse.gov.

***Conducted annually since 1975, MTF assesses drug use and attitudes among 8th-, 10th-, and 12th-graders, college students, and young adults nationwide. The survey is conducted by the University of Michigan's Institute for Social Research and is funded by NIDA. Copies of the latest published survey are available from the National Clearinghouse for Alcohol and Drug Information at 1-800-729-6686 or may be downloaded from www.monitoringthefuture.org.

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