



BULLETIN

DXM (Dextromethorphan)

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U. S. D E P A R T M E N T O F J U S T I C E

The abuse of DXM (dextromethorphan)—a common ingredient contained in over-the-counter cough and cold medicines—is an increasing concern for law enforcement officers in the United States. Adolescents are the primary abusers of the drug, most likely because it is inexpensive and relatively easy to obtain. Additionally, because DXM is a common ingredient in many cough and cold medicines, many adolescents do not perceive any risk in abusing the drug. Compounding the problem is that few parents know about the potential for abuse of the drug.

Background

DXM is a synthetically produced substance that is chemically related to codeine, though it is not an opiate. DXM is an ingredient in more than 140 over-the-counter cough and cold remedies and since the 1950s has gradually replaced codeine as the most widely used cough suppressant in the United States. It is available in capsule, liquid, liquid gelatin capsule, lozenge, and tablet forms. It also is available in powdered form on the Internet—typically for sale to laboratories conducting research on DXM.

When ingested at recommended dosage levels, DXM generally is a safe and highly effective cough suppressant; however, when ingested in larger amounts, DXM produces negative physiological effects. Reports of DXM abuse have resulted in monitoring by the Drug Enforcement Administration (DEA), and DXM could be added to the Controlled Substances Act if warranted. In 2003 legislation was introduced in Texas and North Dakota to prohibit the sale of DXM to minors. The proposed legislation did not pass in either state. A similar bill introduced in California this year was also defeated.

Slang terms for DXM include DM, robo, rojo, and velvet. Slang terms for DXM intoxication include robo tripping, skitting, and dexing.

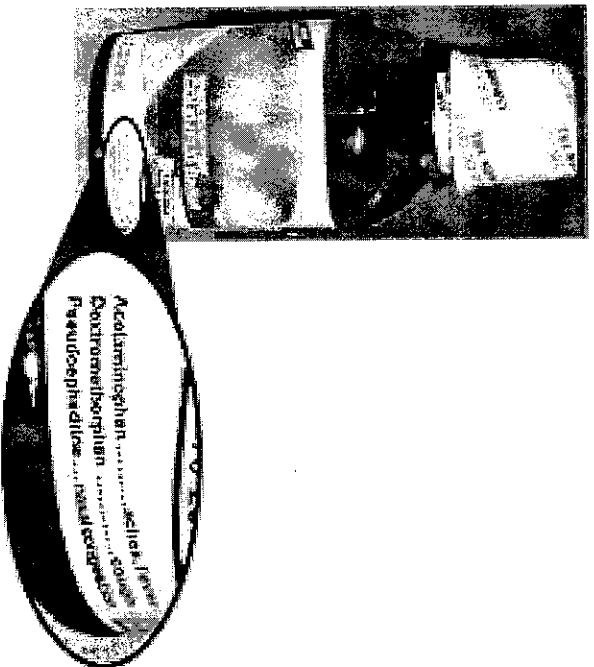
Abuse

Most DXM abusers ingest the drug orally, although some snort the pure powdered form of the drug. Abusers ingest various amounts of DXM depending on their body weight and the effect or plateau that they are attempting to achieve (see text box on page 2). Some abusers ingest 250 to 1,500 milligrams in a single dosage, far more than the recommended therapeutic dose of 10 to 20 milligrams every 4 hours or 30 milligrams every 6 to 8 hours.

Over-the-counter products that contain DXM often contain other ingredients such as acetaminophen, chlorpheniramine, and guaifenesin. Large dosages of acetaminophen can cause liver damage; large dosages of chlorpheniramine can cause increased heart rate, lack of coordination, seizures, and coma; and large dosages of guaifenesin can cause vomiting. Some first-time users may not abuse DXM repeatedly if they experience negative

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side effects—such as vomiting—commonly associated with the other ingredients contained in over-the-counter DXM medications. Nonetheless, some DXM abusers “robo shake,” a practice whereby they drink a large amount of cough syrup containing DXM and then force themselves to vomit so as to absorb enough DXM through the stomach lining to achieve the desired effect while expelling the other ingredients. Some more experienced abusers use a chemical procedure to extract the DXM from the other ingredients contained in cough syrups to avoid such side effects. (This procedure cannot be used on DXM products sold in nonliquid form.)



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Figure 1. Cough medications with DXM may contain other active ingredients.

Recommended dosages of DXM generally are safe but can cause nausea, gastrointestinal disturbances, slight drowsiness, and dizziness. Acute dosages (between 250 and 1,500 milligrams) can cause blurred vision, body itching, rash, sweating, fever, hypertension, shallow respiration, diarrhea, toxic psychosis, coma, and an increase in heart rate, blood pressure, and body temperature. Some abusers become violent after ingesting the drug. Little is known about the long-term effects of DXM abuse; however, anecdotal reporting and limited clinical

research suggest that extensive and prolonged abuse may cause learning and memory impairment. While studies indicate that DXM is not addictive, some former DXM abusers report experiencing cravings for the drug.

DXM Plateaus

Abusers describe the DXM experience as occurring on four different plateaus. Abusers ingest increasing amounts of DXM (based on their weight) to reach each succeeding plateau. Abusers report the following effects occurring in each plateau:

First Plateau: Mild inebriation.

Second Plateau: An effect similar to alcohol intoxication and, occasionally, mild hallucinations. The abuser's speech can become slurred, and short-term memory may be temporarily impaired.

Third Plateau: An altered state of consciousness. The abuser's senses, particularly vision, can become impaired.

Fourth Plateau: Mind and body dissociation or an “out-of-body” experience. The abuser can lose some or all contact with his or her senses. The effects at this plateau are comparable to the effects caused by ketamine or PCP (phencyclidine).

Deaths caused by DXM overdoses are rare as most abusers ingest DXM products that contain other ingredients that cause vomiting, which expels the DXM from their bodies. Most DXM-related deaths are caused by ingesting the drug in combination with other drugs. DXM-related deaths also occur from impairment of the senses, which can lead to accidents. In 2003, a 14-year-old boy in Colorado who abused DXM died when he was hit by two cars as he attempted to cross a highway. State law enforcement investigators suspect that the drug affected the boy's depth perception and caused him to misjudge the distance and speed of the oncoming vehicles.

DXM abuse levels are difficult to determine. Commonly used drug toxicology screens and field

tests do not accurately detect the presence of DXM. Therefore, more thorough laboratory testing must be performed. DEA recommends the gas chromatography/mass spectrometer (GC/MS) test, as other laboratory tests may produce false positives.

National surveys conducted to estimate rates of drug abuse do not include questions regarding DXM. However, the American Association of Poison Control Centers reports that the total number of calls to centers nationwide involving DXM abuse or misuse have increased since 2000 (see Table 1). Calls involving abuse or misuse of DXM by teenagers increased approximately 100 percent from 2000 (1,623) through 2003 (3,271). Calls involving abuse by other age groups increased 21 percent from 2000 through 2002, before decreasing slightly in 2003.

Table 1. Calls Involving Abuse or Misuse of DXM to Poison Control Centers

Year	Teenagers	All Other Age Groups
2000	1,623	900
2001	2,276	1,107
2002	2,881	1,139
2003	3,271	1,111

Source: American Association of Poison Control Centers.

Availability

DXM abusers can obtain the drug at almost any pharmacy or supermarket. Most seek out products that have a high concentration of the drug. One of the most frequently abused products containing DXM is Coricidin® HBP Cough & Cold, which contains 30 milligrams of DXM per tablet. Abusers often refer to Coricidin® HBP Cough & Cold as triple C because of the three Cs imprinted on the red tablets. Other slang terms include skittles, dex, candy, and red devils. Another frequently abused product containing DXM is Robiussin® DM, a syrup that contains 2 milligrams of DXM per milliliter.

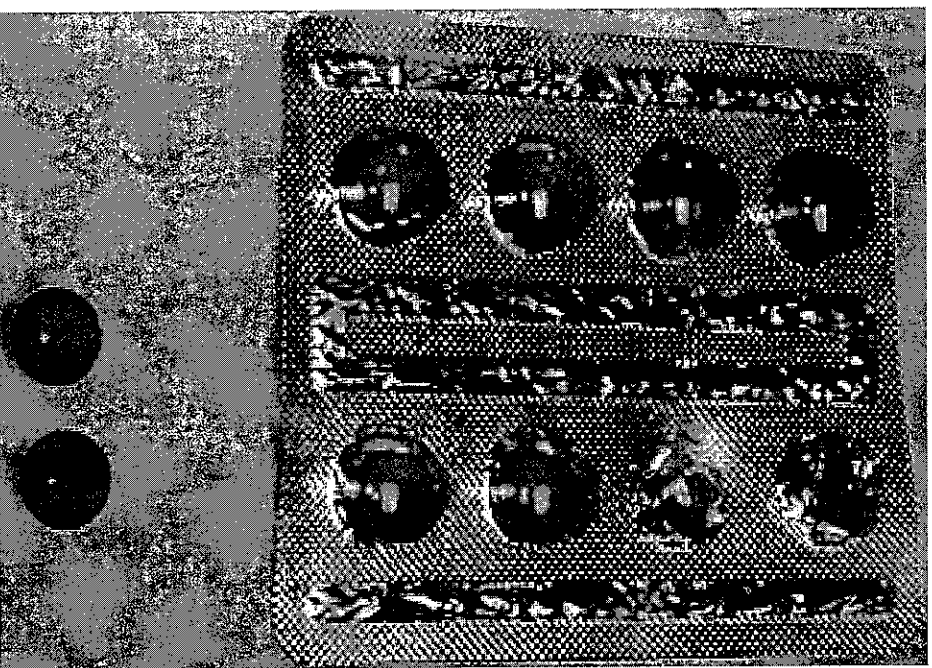


Figure 2. Coricidin® HBP Cough & Cold tablets.

Concerns about shoplifting and abuse of products containing DXM have resulted in some stores instituting new policies and procedures regarding access and sales of such products. Specifically, some stores place such products where consumers must ask for them, and some have limited the number of packages that can be sold to each customer.

DXM frequently is available at raves and other venues where youths congregate. At such events, DXM occasionally is sold as another drug or in combination with other drugs. For example, DXM sometimes is sold in tablet form by drug dealers who claim that the tablet contains MDMA (3,4-methylenedioxymethamphetamine, also known as ecstasy). When DXM is used in combination with MDMA, the combination can increase the risk of life-threatening hyperthermia. Drug dealers also have distributed DXM to abusers who thought they were purchasing heroin or ketamine.

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Figure 3. Cough syrup with DXM.

Pure powdered DXM—typically intended for sale to laboratories conducting research on the drug—is available from some Internet web sites. DXM purchased from such sites contains no other ingredients, which substantially increases the risk of overdose. Two powdered DXM-related deaths occurred in Illinois—one in September 2003 and the other in February 2004. One incident was ruled a suicide; the other was an accidental overdose.

Outlook

DXM abuse among adolescents most likely will increase as the drug is relatively easy to obtain and inexpensive. Moreover, adolescents perceive the risk in abusing the drug as low. Stemming DXM abuse will require increased public awareness of the drug's potential for abuse, increased awareness of the inherent risks associated with abusing DXM, and increased diligence of parents, educators, health care providers, law enforcement personnel, and retailers who market products containing DXM.

Sources

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American Journal of Health-System Pharmacy
Associated Press
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 Drug Enforcement Administration
 Maryland Poison Control Center
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