



DEXTROMETHORPHAN

(Street Names: DXM, CCC, Triple C, Skittles, Robo, Poor Man's PCP)

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DEA/OD/ODE

Introduction:

Dextromethorphan (DXM) is an over-the-counter (OTC) cough suppressant commonly found in cold medications. DXM is often abused in high doses by adolescents to generate euphoria and visual and auditory hallucinations. Illicit use of DXM is referred to on the street as "Robo-tripping" or "skittling." These terms are derived from the most commonly abused products, Robitussin and Coricidin.

Licit Uses:

DXM is an antitussive found in more than 120 OTC cold medications either alone or in combination with other drugs such as analgesics (e.g. acetaminophen), antihistamines (e.g. chlorpheniramine), decongestants (e.g., pseudoephedrine) and/or expectorants (e.g., guaifenesin). The typical antitussive adult dose is 15 or 30 mg taken three to four times daily. The antitussive effects of DXM persist for 5 to 6 hours after oral administration. When taken as directed, side-effects are rarely observed. IMS Health® reports a total of 10.7 million DXM medications dispensed in 2013.

Illicit Use:

DXM is abused by individuals of all ages but its abuse by teenagers and young adults is of particular concern. This abuse is fueled by DXM's OTC availability and extensive "how to" abuse information on various web sites. The sale of the powdered form of DXM over the Internet poses additional risks due to the uncertainty of composition and dose.

DXM abusers report a heightened sense of perceptual awareness, altered time perception, and visual hallucinations. The typical clinical presentation of DXM intoxication involves hyperexcitability, lethargy, ataxia, slurred speech, sweating, hypertension, and/or nystagmus. Abuse of combination DXM products also results in health complications from the other active ingredient(s), which include increased blood pressure from pseudoephedrine, potential delayed liver damage from acetaminophen, and central nervous system toxicity, cardiovascular toxicity and anticholinergic toxicity from antihistamines. The use of high doses of DXM in combination with alcohol or other drugs is particularly dangerous and deaths have been reported.

Abusers of DXM describe the following four dose-dependent "plateaus:"

Plateau	Dose (mg)	Behavioral Effects
1 st	100–200	Mild stimulation
2 nd	200–400	Euphoria and hallucinations
3 rd	300– 600	Distorted visual perceptions Loss of motor coordination
4 th	500-1500	Dissociative sedation

According to the American Association of Poison Control Centers, there were 45,748 case mentions, 33,811 single exposures, and six deaths related to dextromethorphan.

The 2011 Monitoring the Future (MTF) Report indicated that the annual prevalence of non-medical use of cough and cold medicines among students in 8th, 10th, and 12th grades was 2.9%, 4.3%, and 5.0%, respectively.

Chemistry/Pharmacology:

Dextromethorphan (DXM) (*d*-3-methoxy-*N*-methylmorphinan) is the dextro isomer of levomethorphan, a semisynthetic morphine derivative. Although structurally similar to other narcotics, DXM does not act as a *mu*-receptor opioid (e.g. morphine, heroin). DXM and its metabolite, dextrorphan, act as potent blockers of the *N*-methyl-*d*-aspartate (NMDA) receptor. At high doses, the pharmacology of DXM is similar to the controlled substances phencyclidine (PCP) and ketamine that also antagonize the NMDA receptor. High doses of DXM produce PCP-like behavioral effects. DXM may cause a false-positive test result with some urine immunoassays for PCP.

Approximately 5-10% of Caucasians are poor DXM metabolizers which increases their risk for overdoses and deaths. DXM should not be taken with antidepressants due to the risk of inducing a life threatening serotonergic syndrome.

Illicit Distribution:

DXM abuse has traditionally been with the OTC liquid cough preparations. More recently, abuse of tablet and gel capsule preparations has increased. DXM powder sold over the Internet is also a source of DXM for abuse. DXM is also distributed in illicitly manufactured tablets, containing only DXM or mixed with other illicit drugs such as ecstasy or methamphetamine.

According to DEA's National Forensic Laboratory Information System (NFLIS) and System to Retrieve Information from Drug Evidence (STRIDE), federal, state and local forensic laboratories reported 180 exhibits identified as DXM in 2012 and 113 identified in 2013.

Control Status:

DXM is not scheduled under the Controlled Substances Act (CSA). However, the CSA indicated that DXM could be added to the CSA, in the future, through the traditional scheduling process, if warranted.

Comments and additional information are welcomed by the Drug and Chemical Evaluation Section; Fax 202-353-1263, telephone 202-307-7183 or Email ODE@usdoj.gov.