

# New The DAWN Report

Issue 32, 2006R

DRUG ABUSE WARNING NETWORK

## Emergency Department Visits Involving Dextromethorphan

### In Brief

According to the Drug Abuse Warning Network (DAWN) for 2004:

- An estimated 16,858 emergency department (ED) visits involved pharmaceuticals containing dextromethorphan (DXM). This was just under 1 percent of all drug-related ED visits.
- The rate of ED visits resulting from nonmedical use of DXM for those aged 12 to 20 was 8.0 visits per 100,000 population, compared with 2.5 visits or fewer per 100,000 for other age groups.
- ED patients aged 12 to 20 accounted for about half (51%) of the ED visits resulting from nonmedical use of DXM, compared with 33 percent of DXM-related ED visits overall.
- The rate of ED visits resulting from any type of use of DXM among those aged 12 to 20 was 14.7 per 100,000 population, compared with 5.7 visits per 100,000 for the population overall.
- Alcohol was implicated in 41 percent of ED visits involving nonmedical use of DXM for those aged 18 to 20 and in 13 percent of visits for those aged 12 to 17.

Dextromethorphan (DXM) is a cough suppressant approved by the Food and Drug Administration (FDA) that is found in many over-the-counter cough and cold remedies.<sup>1</sup> It is generally safe when taken at recommended doses. When taken in large amounts, though, DXM can produce hallucinations and a “high” similar to psychotropic drugs, such as phencyclidine (PCP). Dangerous side effects may include blurred vision, loss of physical coordination, abdominal pain, and rapid heartbeat. Side effects may be worsened if the ingested product also contains other pharmaceutical ingredients—such as acetaminophen, pseudoephedrine, antihistamines, or expectorants, which are commonly found in cough and cold medicines—or alcohol.<sup>2</sup>

In recent years DXM has become available, primarily over the Internet, in bulk powdered form, and concern has grown over the nonmedical use of DXM by teenagers. In May 2005, the FDA issued a warning about the dangers of DXM abuse involving over-the-counter products and DXM obtained from illicit sources.<sup>3</sup>

The Drug Abuse Warning Network (DAWN) collects data from a national sample of short-term, general, non-Federal hospitals<sup>4</sup> and publishes estimates of emergency department (ED) visits involving illicit drugs and nonmedical use of pharmaceuticals. This issue of *The DAWN Report* examines the characteristics of ED visits that involve DXM and products containing DXM.

Included are findings on the age of ED patients who used DXM and the reason for their visit to the ED. Also provided are the rates of DXM-related ED visits per 100,000 population for different age groups and the frequency with which DXM products are found in combination with alcohol. The ED visits considered here exclude the small number of patients who go to the ED to obtain admission to the hospital's detoxification or substance abuse treatment unit.

## Overview

During 2004, there were about 106 million ED visits to short-term, general, non-Federal hospitals in the United States.<sup>5</sup> Of those, DAWN estimates that just over 2.5 million were drug related, with just under a half million involving nonmedical use of pharmaceuticals. Nearly 17,000, or just under 1 percent, of all drug-related ED visits in 2004 involved DXM or products containing DXM.

## Reasons for ED visits

Nonmedical use of DXM products accounted for 5,962 (35%) of the estimated 16,858 DXM-related ED visits in 2004, and about half (51%) of these nonmedical visits involved patients aged 12 to 20 (Table 1).<sup>6</sup> The rate of ED visits resulting from nonmedical use of DXM products was 8.0 visits per 100,000 population for those aged 12 to 20, while the rate for other age groups was 2.5 or less (Table 1 and Figure 1).

Medical use of DXM included ED visits attributed to adverse reactions that occurred when DXM products were used as prescribed (or according to directions for over-the-counter products). About 31 percent of all DXM-related ED visits in 2004 were a result of adverse reactions. Children aged 0 to 11 are the most likely to experience adverse reactions to DXM. Their rate of ED visits was higher than that for any other age group (3.9 per 100,000 population), and they constitute 36 percent of all ED visits involving adverse reactions to DXM.

About 16 percent of DXM-related ED visits involve accidental ingestion. As with adverse reactions, children aged 0 to 11 are also the most likely to accidentally ingest DXM or DXM-containing products. The rate of ED visits for accidental ingestion of DXM is 5.2 visits per 100,000 population, and over 95 percent of ED visits for accidental ingestion of DXM involve children in this age range.

Suicide attempts involving DXM products accounted for 17 percent of DXM-related ED visits. Patients

**Table 1. ED visits involving DXM, by age and reason for visit**

Age category	Estimated ED visits	Percent of visits <sup>a</sup>	ED visits per 100,000 population
<b>Nonmedical use (35% of total)</b>			
0-11	42	1%	0.1
12-20	3,016	51%	8.0
12-17	1,938	33%	7.6
18-20	1,078	18%	8.7
21-34	1,451	24%	2.5
35+	1,448	24%	1.0
<b>Medical use (adverse reaction) (31% of total)</b>			
0-11	1,879	36%	3.9
12-20	744	14%	2.0
12-17	701	13%	2.8
18-20	43	1%	0.4
21-34	682	13%	1.2
35+	1,890	36%	1.3
<b>Accidental ingestion (15% of total)</b>			
0-11	2,478	96%	5.2
12-20	—	0%	0.0
12-17	—	0%	0.0
18-20	—	0%	0.0
21-34	—	0%	0.0
35+	109	4%	0.1
<b>Suicide attempt (17% of total)</b>			
0-11	—	0%	0.0
12-20	1,610	55%	4.3
12-17	1,154	40%	4.5
18-20	456	16%	3.7
21-34	527	18%	0.9
35+	778	27%	0.5
<b>Total<sup>b</sup></b>			
All ages	16,858	100%	5.7
0-11	4,399	26%	9.2
12-20	5,556	33%	14.7
12-17	3,970	24%	15.6
18-20	1,586	9%	12.8
21-34	2,662	16%	4.7
35+	4,236	25%	2.8

<sup>a</sup> Percentages may not sum to 100 percent due to rounding.

<sup>b</sup> This total includes only the four types of ED visits shown. This excludes patients who go to the ED to obtain admission to a hospital's detoxification or substance abuse treatment unit.

Note: — Estimates less than 30 are suppressed.

Source: Office of Applied Studies, SAMHSA, Drug Abuse Warning Network, 2004 (03/2008 update).

aged 12 to 20 are more likely than patients in other age groups to use DXM products in a suicide attempt. This group has a rate of 4.3 DXM-related ED visits per 100,000 population, compared with rates of 0.0 for those aged 0 to 11 and less than 1.0 for those aged 21 or older.

### Alcohol involvement

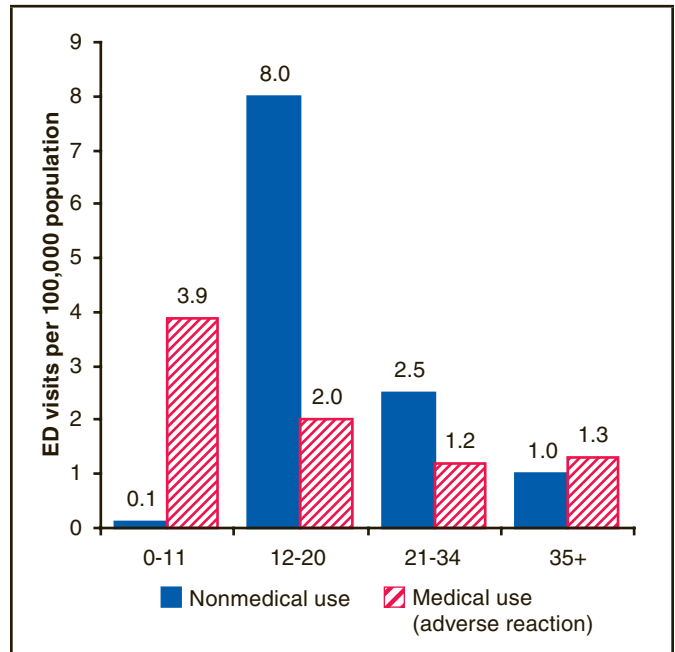
Alcohol was involved in about 13 percent of ED visits resulting from nonmedical use of DXM products for those aged 12 to 17 and in 41 percent of such visits for those aged 18 to 20 (Figure 2). Patients aged 35 to 54 had the highest involvement of alcohol (61%). For the youngest (aged 0 to 11) and oldest (aged 55 or older) patients, alcohol involvement was lower (0% and 2%, respectively).

Alcohol is also an ingredient in some cough medications. Some common products (e.g., NyQuil®) contain a mixture of DXM and up to 10 percent alcohol. In these cases, alcohol may play a role in the ED visit without being specifically documented in the ED medical record. Therefore, these findings may understate the involvement of alcohol and its contribution to the side effects leading to ED visits.

### Notes

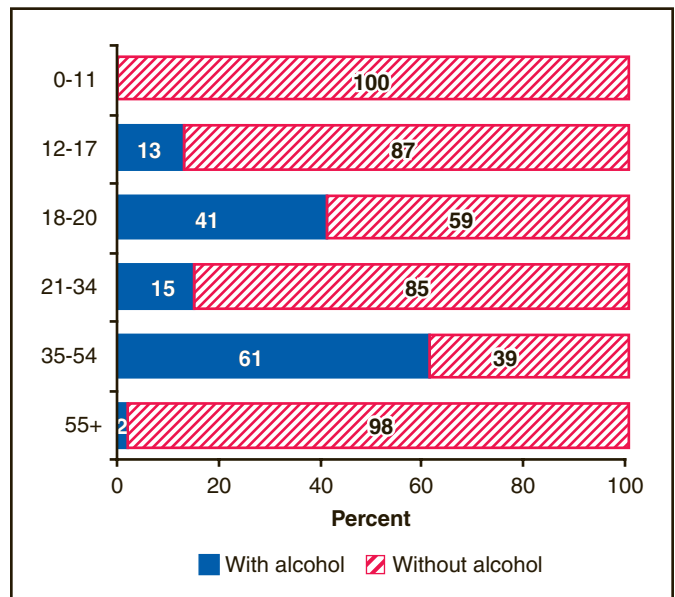
1. U.S. National Library of Medicine, National Institutes of Health. (2003, April 1). *Dextromethorphan*. Retrieved September 26, 2006, from <http://www.nlm.nih.gov/medlineplus/druginfo/medmaster/a682492.html>
2. National Institute on Drug Abuse. (2001, March). *Hallucinogens and dissociative drugs* (NIH Publication No. 01-4209). Retrieved September 29, 2006, from <http://www.drugabuse.gov/ResearchReports/Hallucinogens/halluc4.html>
3. Food and Drug Administration. (2005, May 20). *FDA warns against abuse of dextromethorphan (DXM)* (Talk Paper T05-23). Rockville, MD: National Press Office. Retrieved September 29, 2006, from <http://www.fda.gov/bbs/topics/ANSWERS/2005/ANS01360.html>
4. Specialty hospitals, including children's hospitals, are excluded from the DAWN sample.
5. American Hospital Association (AHA) Annual Survey Database, Fiscal Year 2003. Health Forum LLC, Copyright 2003, One North Franklin Street, Chicago, IL 60606.
6. Nonmedical use of DXM includes taking more than a prescribed or recommended dose and other forms of drug misuse or abuse.

**Figure 1. Rates of ED visits for nonmedical and medical use of DXM, by age**



Source: Office of Applied Studies, SAMHSA, Drug Abuse Warning Network, 2004 (03/2008 update).

**Figure 2. ED visits involving nonmedical use of DXM and alcohol, by age**



Source: Office of Applied Studies, SAMHSA, Drug Abuse Warning Network, 2004 (03/2008 update).

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The **Drug Abuse Warning Network (DAWN)** is a public health surveillance system that monitors drug-related morbidity and mortality. DAWN uses a probability sample of hospitals to produce estimates of drug-related emergency department (ED) visits for the United States and selected metropolitan areas annually. DAWN also produces annual profiles of drug-related deaths reviewed by medical examiners or coroners in selected metropolitan areas and States.

Any ED visit or death related to recent drug use is included in DAWN. All types of drugs—licit and illicit—are covered. Alcohol is included for adults when it occurs with another drug. Alcohol is always included for minors. DAWN's method of classifying drugs was derived from the Multum *Lexicon*, Copyright © 2008, Multum Information Services, Inc. The Multum Licensing Agreement can be found in DAWN annual publications and at <http://www.multum.com/license.htm>.

DAWN is one of three major surveys conducted by the Substance Abuse and Mental Health Services Administration's Office of Applied Studies (SAMHSA/OAS). For information on other OAS surveys, go to <http://www.oas.samhsa.gov>. SAMHSA has contracts with Westat (Rockville, MD) and RTI International (Research Triangle Park, NC) to operate the DAWN system and produce publications.

For publications and additional information about DAWN, go to <http://DAWNinfo.samhsa.gov>.