

The DAWN Report

July 12, 2012

Outcomes of Drug-Related Emergency Department Visits Associated with Polydrug Use

In Brief

- In 2009, the majority of emergency department (ED) visits involving cocaine or marijuana use involved polydrug use (68 and 73 percent, respectively), whereas slightly more than half of heroin-related visits involved polydrug use (52 percent)
- For ED visits involving nonmedical use of selected pharmaceuticals, polydrug use involvement ranged from 63 percent for narcotic pain relievers to 80 percent for muscle relaxants
- Patients whose ED visits involved heroin and another drug were more likely to have been admitted to the hospital than patients whose visits involved heroin only (28 vs. 22 percent) and were less likely to have been treated and released (55 vs. 68 percent)
- Among visits involving nonmedical use of narcotic pain relievers or benzodiazepines, polydrug use was associated with an increased likelihood of hospitalization

Polydrug use (use of more than one substance) can create complex chemical reactions in the body, with unpredictable outcomes.¹ Drugs that have a sedative effect can be especially dangerous when combined with other drugs or alcohol.² Use of multiple illicit or pharmaceutical drugs, including combinations with alcohol, may require immediate medical treatment followed by more advanced care and evaluation in a hospital setting. Characterizing the presence of multiple substances in drug-related emergency department (ED) visits can lead to a better understanding of which polydrug use behaviors most often require hospitalization. The Drug Abuse Warning Network (DAWN) can be used to generally describe ED visits involving multiple drugs; future reports will examine visits involving specific drug combinations in more detail.

DAWN is a public health surveillance system that monitors drug-related ED

visits in the United States. To be a DAWN case, the ED visit must have involved a drug, either as the direct cause of the visit or as a contributing factor. This issue of *The DAWN Report* focuses on visits in 2009 that involved selected illicit drugs (cocaine, heroin, and marijuana) or nonmedical use³ of selected pharmaceuticals: narcotic pain relievers (e.g., OxyContin[®]), benzodiazepines (e.g., Xanax[®]), muscle relaxants (e.g., Flexeril[®]), and central nervous system (CNS) stimulants (e.g., Ritalin[®]). “Polydrug use” is defined in this report as the presence of more than one drug, including illicit drugs, pharmaceuticals, or alcohol. ED visits that result in admission to the same hospital are hereafter referred to as “hospitalizations”; patients may also be hospitalized after being transferred to another health care facility (e.g., psychiatric facility, veterans’ hospital). Because drug-related ED visits often involve multiple drugs, some visits (and resulting hospitalizations) may be counted multiple times if they involve more than one of the drugs discussed in this report.

Overview

In 2009, about 4.5 million drug-related ED visits occurred; of these, cocaine was involved in 422,901 visits, marijuana was involved in 376,486 visits, and heroin was involved in 213,118 visits (Table 1). Among visits involving nonmedical use of pharmaceuticals, those involving narcotic pain relievers (342,983 visits) or benzodiazepines (312,931 visits) were most common, followed by muscle relaxants (50,878 visits) and CNS stimulants (21,799 visits).

ED Visits Involving Single and Polydrug Use

For drug-related ED visits occurring in 2009, the likelihood of polydrug, also referred to as multiple drug, involvement varied depending on the type of drug involved. The majority of visits associated with use of cocaine or marijuana involved polydrug use (68 and 73 percent, respectively), whereas slightly more than half of heroin-related

visits involved polydrug use (52 percent) (Figure 1). The majority of visits associated with the types of pharmaceuticals included in this report involved polydrug use (narcotic pain relievers: 63 percent, benzodiazepines: 79 percent, muscle relaxants: 80 percent, CNS stimulants: 67 percent).

Disposition of ED Visits Involving Selected Illicit Drugs

For ED visits that involved cocaine, the presence of other drugs did not appear to influence the outcome of the ED visit. About half of patients were treated and released for both single and polydrug cocaine use (51 and 53 percent, respectively) (Figure 2). Both groups were also equally likely to be admitted to the hospital (34 and 29 percent, respectively). However, patients whose ED visits involved polydrug cocaine use were slightly more likely than patients whose visits involved cocaine only to be transferred to another health care facility (12 vs. 8 percent).

Table 1. Emergency Department (ED) Visits, by Type of Drug Involvement: 2009

Type of Drug Involvement	Number of ED Visits
Cocaine	422,901
Marijuana	376,486
Heroin	213,118
Narcotic Pain Relievers*	342,983
Benzodiazepines*	312,931
Muscle Relaxants*	50,878
Central Nervous System Stimulants*	21,799

* Visits involving pharmaceuticals include nonmedical drug use visits only.

Source: 2009 SAMHSA Drug Abuse Warning Network (DAWN).

Polydrug use was associated with differing outcomes for ED visits involving marijuana or heroin. Patients whose ED visits involved polydrug marijuana use were more likely than those whose visits involved marijuana only to have been admitted to the hospital (23 vs. 16 percent) and less likely to have been treated and released (58 vs. 69 percent) (Figure 3). Similarly, patients whose ED visits involved polydrug heroin use were more likely than patients whose visits involved heroin only to have been admitted to the hospital (28 vs. 22 percent) and were less likely to have been treated and released (55 vs. 68 percent) (Figure 4).

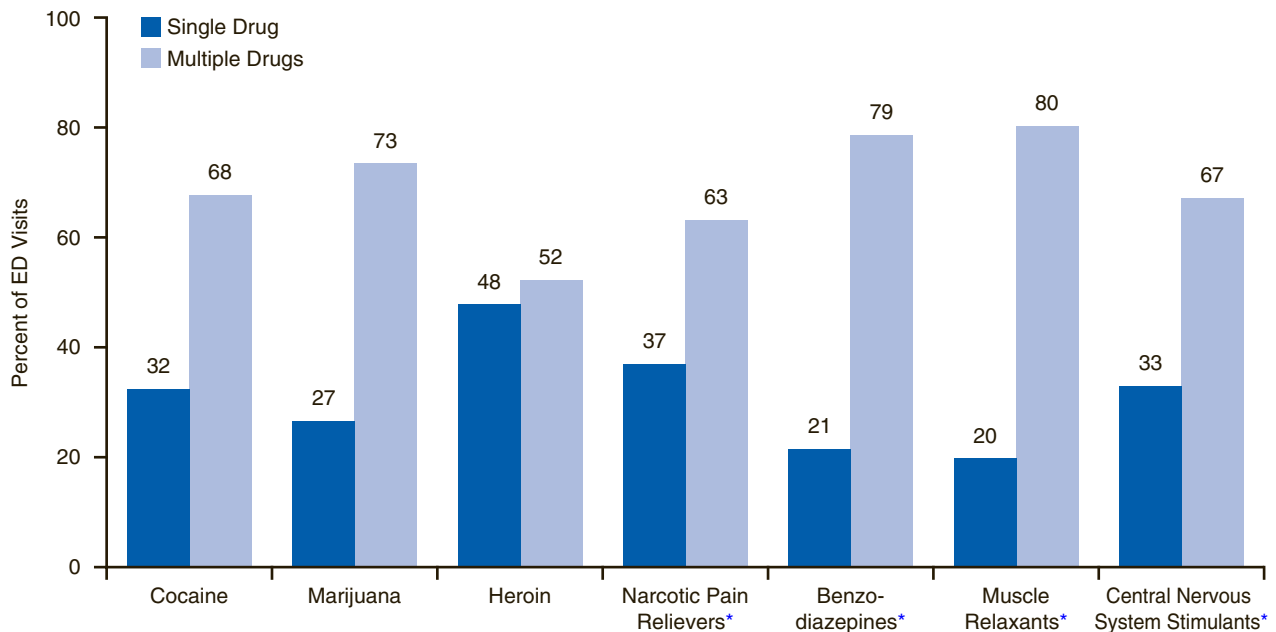
Disposition of ED Visits Involving Nonmedical Use of Selected Pharmaceuticals

Among visits involving nonmedical use of narcotic pain relievers or benzodiazepines, polydrug use was associated with an increased likelihood of hospitalization. Patients whose visit involved

nonmedical use of a narcotic pain reliever in combination with another drug were more likely than patients whose visit involved a narcotic pain reliever only to be admitted to the hospital (30 vs. 19 percent) and less likely to be treated and released (56 vs. 74 percent) (Figure 5). Patients whose ED visits involved nonmedical use of a benzodiazepine in combination with another drug were more likely than those whose visits involved nonmedical use of a benzodiazepine only to have been admitted to the hospital (32 vs. 26 percent) and were less likely to be treated and released (52 vs. 63 percent) (Figure 6).

ED visits involving nonmedical use of muscle relaxants had similar outcomes regardless of the presence of polydrug use (Figure 7). For visits involving nonmedical use of a CNS stimulant, those involving polydrug use were less likely than those involving a CNS stimulant alone to have been treated and released (65 vs. 78 percent); however, other outcomes were similar between the two groups (Figure 8).

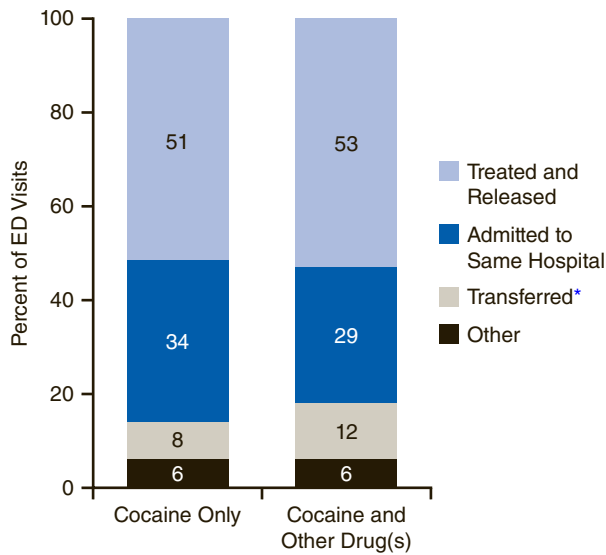
Figure 1. Percentage of Emergency Department (ED) Visits Involving Multiple or Single Drugs for Selected Illicit Drugs and Pharmaceuticals: 2009



* Visits involving pharmaceuticals include nonmedical drug use visits only.

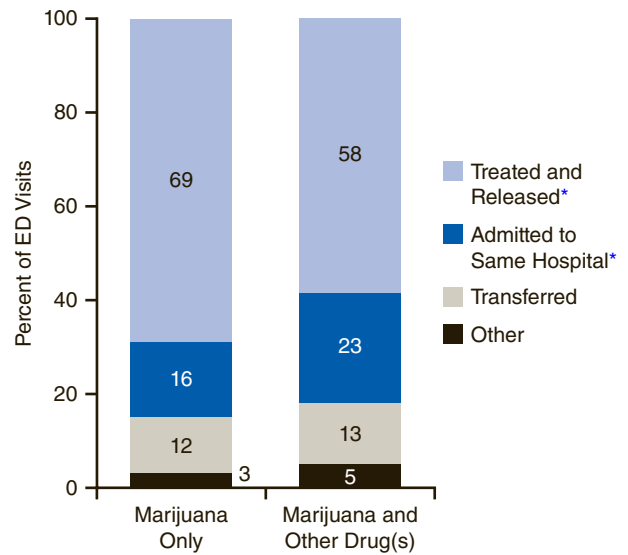
Source: 2009 SAMHSA Drug Abuse Warning Network (DAWN).

Figure 2. Disposition of Emergency Department (ED) Visits Involving Cocaine: 2009



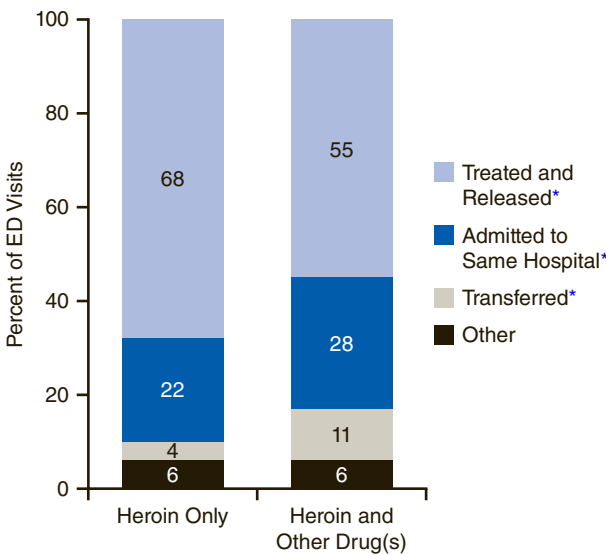
* The difference between visits involving cocaine only and those involving cocaine in combination with other drug(s) is significant at the .05 level.
 Source: 2009 SAMHSA Drug Abuse Warning Network (DAWN).

Figure 3. Disposition of Emergency Department (ED) Visits Involving Marijuana: 2009



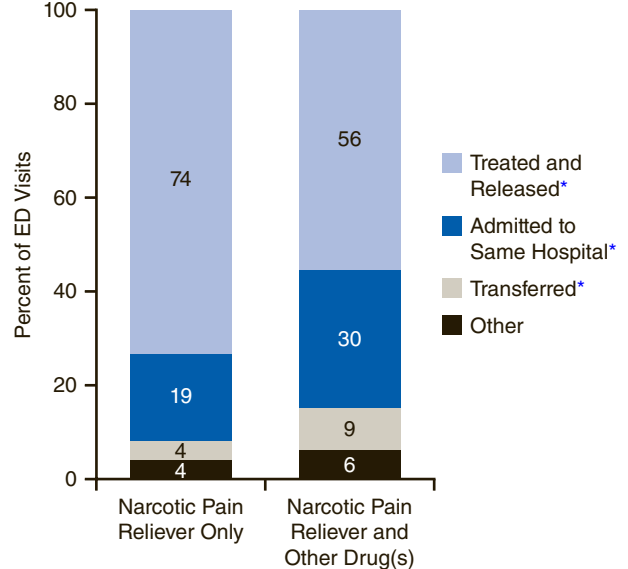
* The difference between visits involving marijuana only and those involving marijuana in combination with other drug(s) is significant at the .05 level.
 Source: 2009 SAMHSA Drug Abuse Warning Network (DAWN).

Figure 4. Disposition of Emergency Department (ED) Visits Involving Heroin: 2009



* The difference between visits involving heroin only and those involving heroin in combination with other drug(s) is significant at the .05 level.
 Source: 2009 SAMHSA Drug Abuse Warning Network (DAWN).

Figure 5. Disposition of Emergency Department (ED) Visits Involving Nonmedical Use of Narcotic Pain Relievers: 2009



* The difference between visits involving narcotic pain relievers only and those involving narcotic pain relievers in combination with other drug(s) is significant at the .05 level.
 Source: 2009 SAMHSA Drug Abuse Warning Network (DAWN).

Discussion

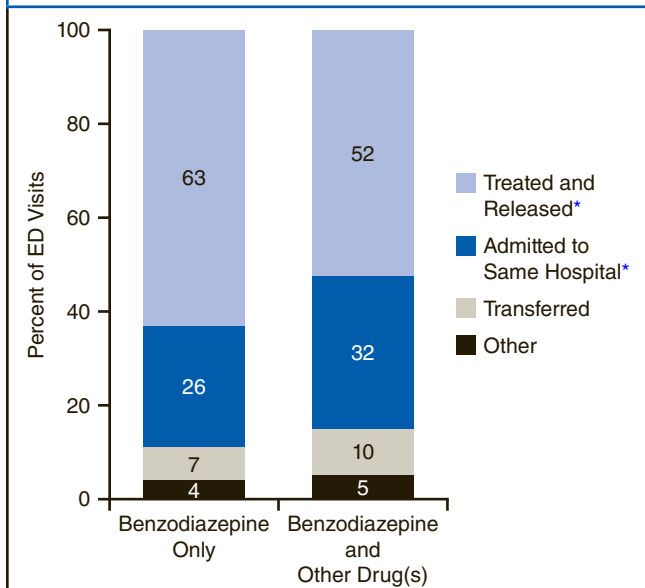
Polydrug use can cause unsafe drug interactions, amplifying the effects of individual drugs. Although the effects will vary depending on the types of drugs involved, the dangers of combining multiple drugs may increase the need for medical treatment. This report presents general information on polydrug use; future reports will focus on more specific drug combinations and outcomes.

The presence of injuries, co-occurring medical and mental health conditions, and the patient’s age can influence the likelihood of hospitalization following a drug-related ED visit. However, this report suggests that the association between polydrug visits and hospitalization varies based on the drugs that were involved in the visit. Cocaine is known to interact dangerously with other substances (e.g., alcohol)⁴; however, factors other than polydrug use may have influenced the outcome of cocaine-related visits. Polydrug

use visits involving cocaine, muscle relaxant, or CNS stimulant combinations were not associated with an increased likelihood of hospitalization compared with visits involving those single drugs alone.

Among visits involving narcotic pain relievers or benzodiazepines, polydrug use was associated with an increased likelihood of hospitalization. These particular drugs cause sedation, which may be compounded by other drugs or alcohol.² The effects of such drug combinations may require efforts to resuscitate or treat suppressed breathing in the ED, with subsequent hospitalization for close monitoring.⁵ Visits involving marijuana or heroin combinations were also more likely to result in hospitalization compared with visits involving a single drug. These findings, coupled with the fact that half of substance abuse treatment admissions involve multiple substances,⁶ stress the importance of comprehensive treatment programs that address polydrug use. Medical costs for an ED patient inevitably increase when that patient requires

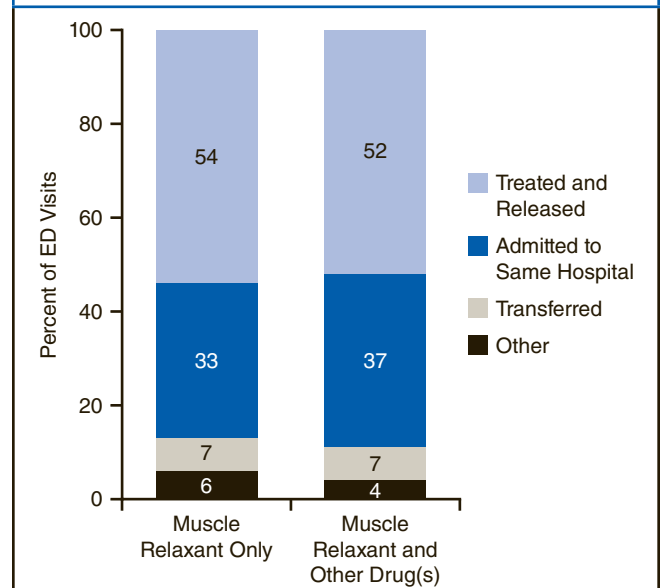
Figure 6. Disposition of Emergency Department (ED) Visits Involving Nonmedical Use of Benzodiazepines: 2009



* The difference between visits involving benzodiazepines only and those involving benzodiazepines in combination with other drug(s) is significant at the .05 level.

Source: 2009 SAMHSA Drug Abuse Warning Network (DAWN).

Figure 7. Disposition of Emergency Department (ED) Visits Involving Nonmedical Use of Muscle Relaxants: 2009



* The difference between visits involving muscle relaxants only and those involving muscle relaxants in combination with other drug(s) is significant at the .05 level.

Source: 2009 SAMHSA Drug Abuse Warning Network (DAWN).

hospitalization or specialized treatment in another health care facility. Therefore, reducing polydrug use may help decrease the overall amount of resources needed to treat drug-related health problems.

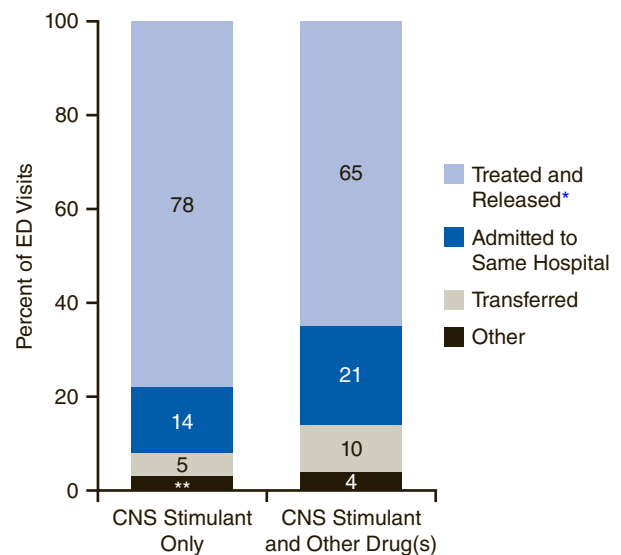
End Notes

- ¹ Dean, A. (2006). Illicit drugs and drug interactions. *Australian Pharmacist*, 25(9), 684-689.
- ² European Monitoring Centre for Drugs and Drug Addiction. (2009). *Polydrug use: Patterns and responses* (Selected Issue 2009). Retrieved from http://www.emcdda.europa.eu/attachements.cfm/att_93217_EN_EMCCDA_S109_polydrug%20use.pdf
- ³ Nonmedical use includes taking more than the prescribed dose of a prescription medication or more than the recommended dose of an over-the-counter (OTC) medication or supplement; taking a prescription medication prescribed for another individual; being deliberately poisoned with a pharmaceutical by another person; and misusing or abusing a prescription medication, an OTC medication, or a dietary supplement.
- ⁴ National Institute on Drug Abuse. (2010). *DrugFacts: Cocaine*. Retrieved from <http://www.drugabuse.gov/publications/drugfacts/cocaine>
- ⁵ Food and Drug Administration (FDA). (2009). *A guide to safe use of pain medicine*. Retrieved from <http://www.fda.gov/downloads/ForConsumers/ConsumerUpdates/ucm095742.pdf>
- ⁶ Substance Abuse and Mental Health Services Administration. (2011). *Treatment Episode Data Set (TEDS). 1999-2009. National admissions to substance abuse treatment services* (DASIS Series: S-56, HHS Publication No. SMA 11-4646). Rockville, MD: Author.

Suggested Citation

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Figure 8. Disposition of Emergency Department (ED) Visits Involving Nonmedical Use of Central Nervous System (CNS) Stimulants: 2009



* The difference between visits involving CNS stimulants only and those involving CNS stimulants in combination with other drug(s) is significant at the .05 level.

** For the CNS stimulant estimate only, other disposition was suppressed due to low statistical precision.

Source: 2009 SAMHSA Drug Abuse Warning Network (DAWN).

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Findings from SAMHSA's 2009 Drug Abuse Warning Network (DAWN)

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- Among visits involving nonmedical use of narcotic pain relievers or benzodiazepines, polydrug use was associated with an increased likelihood of hospitalization

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 related to recent drug use is included in DAWN. All types of drugs—licit and illicit—are covered. Alcohol involvement is documented for patients of all ages if it occurs with another drug. Alcohol is considered an illicit drug for minors and is documented even if no other drug is involved. The classification of drugs used in DAWN is derived from the Multum *Lexicon*, copyright 2010 Lexi-Comp, Inc. and/or Cerner Multum, Inc. The Multum Licensing Agreement governing use of the *Lexicon* can be found at <http://www.samhsa.gov/data/DAWN.aspx>.

DAWN is one of three major surveys conducted by the Substance Abuse and Mental Health Services Administration's Center for Behavioral Health Statistics and Quality (SAMHSA/CBHSQ). For more information on other CBHSQ surveys, go to <http://www.samhsa.gov/data>. 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://www.samhsa.gov/data/DAWN.aspx>.



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