



Morbidity and Mortality Weekly Report (MMWR)

CDC Grand Rounds: Prescription Drug Overdoses — a U.S. Epidemic

Weekly

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This is another in a series of occasional MMWR reports titled CDC Grand Rounds. These reports are based on grand rounds presentations at CDC on high-profile issues in public health science, practice, and policy. Information about CDC Grand Rounds is available at <http://www.cdc.gov/about/grand-rounds>.

In 2007, approximately 27,000 unintentional drug overdose deaths occurred in the United States, one death every 19 minutes. Prescription drug abuse is the fastest growing drug problem in the United States. The increase in unintentional drug overdose death rates in recent years ([Figure 1](#)) has been driven by increased use of a class of prescription drugs called opioid analgesics ([1](#)). Since 2003, more overdose deaths have involved opioid analgesics than heroin and cocaine combined ([Figure 2](#)) ([1](#)). In addition, for every unintentional overdose death related to an opioid analgesic, nine persons are admitted for substance abuse treatment ([2](#)), 35 visit emergency departments ([3](#)), 161 report drug abuse or dependence, and 461 report nonmedical uses of opioid analgesics ([4](#)). Implementing strategies that target those persons at greatest risk will require strong coordination and collaboration at the federal, state, local, and tribal levels, as well as engagement of parents, youth influencers, health-care professionals, and policy-makers.

Overall, rates of opioid analgesic misuse and overdose death are highest among men, persons aged 20–64 years, non-Hispanic whites, and poor and rural populations. Persons who have mental illness are overrepresented among both those who are prescribed opioids and those who overdose on them. Further defining populations at greater risk is critical for development and implementation of effective interventions. The two main populations in the United States at risk for prescription drug overdose are the approximately 9 million persons who report long-term medical use of opioids ([5](#)), and the roughly 5 million persons who report nonmedical use (i.e., use without a prescription or medical need), in the past month ([4](#)). In an attempt to treat patient pain better, practitioners have greatly increased their rate of opioid prescribing over the past decade. Drug distribution through the pharmaceutical supply chain was the equivalent of 96 mg of morphine per person in 1997 and approximately 700 mg per person in 2007, an increase of >600% ([6](#)). That 700 mg of morphine per person is enough for everyone in the United States to take a typical 5 mg dose of Vicodin (hydrocodone and acetaminophen) every 4 hours for 3 weeks. Persons who abuse opioids have learned to exploit this new practitioner sensitivity to patient pain, and clinicians struggle to treat patients without overprescribing these drugs.

Among patients who are prescribed opioids, an estimated 80% are prescribed low doses (<100 mg morphine equivalent dose per day) by a single practitioner ([7,8](#)), and these patients account

for an estimated 20% of all prescription drug overdoses ([Figure 3](#)). Another 10% of patients are prescribed high doses (≥ 100 mg morphine equivalent dose per day) of opioids by single prescribers and account for an estimated 40% of prescription opioid overdoses ([9,10](#)). The remaining 10% of patients are of greatest concern. These are patients who seek care from multiple doctors and are prescribed high daily doses, and account for another 40% of opioid overdoses ([11](#)). Persons in this third group not only are at high risk for overdose themselves but are likely diverting or providing drugs to others who are using them without prescriptions. In fact, 76% of nonmedical users report getting drugs that had been prescribed to someone else, and only 20% report that they acquired the drug from their own doctor ([4](#)). Furthermore, among persons who died of opioid overdoses, a significant proportion did not have a prescription in their records for the opioid that killed them; in West Virginia, Utah, and Ohio, 25%–66% of those who died of pharmaceutical overdoses used opioids originally prescribed to someone else ([11–13](#)). These data suggest that prevention of opioid overdose deaths should focus on strategies that target 1) high-dosage medical users and 2) persons who seek care from multiple doctors, receive high doses, and likely are involved in drug diversion.

Prevention Strategies

Some promising strategies exist for addressing these two high-risk groups. The first is use of prescription data combined with insurance restrictions to prevent "doctor shopping" and reduce inappropriate use of opioids. Users of multiple providers for the same drug, people routinely obtaining early refills, and persons engaged in other inappropriate behaviors can be tracked with state prescription drug monitoring programs or insurance claim information. Public and private insurers can limit the reimbursement of claims for opioid prescriptions to a designated doctor and a designated pharmacy. This action is especially important for public insurers because Medicaid recipients and other low-income populations are at high risk for prescription drug overdose. Insurers also can identify inappropriate use of certain opioids for certain diagnoses (e.g., the use of extended-release or long-acting opioids like transdermal fentanyl or methadone for short-term pain).

A second strategy is improving legislation and enforcement of existing laws. Most states now have laws against doctor shopping, but they are not enforced uniformly. In contrast, only a few states have laws regulating for-profit clinics that distribute controlled prescription drugs with minimal medical evaluation. Laws against such "pill mills" as well as laws that require physical examinations before prescribing might help reduce the diversion of these drugs for nonmedical use. In addition, a variety of other state controls on prescription fraud are being employed. For example, according to the National Alliance for Model State Drug Laws, 15 states required or permitted pharmacists to request identification from persons obtaining controlled substances as of March 2009.*

A third strategy is to improve medical practice in prescribing opioids. Care for patients with complex chronic pain problems is challenging, and many prescribers receive little education on this topic. As a result, prescribers too often start patients on opioids and expect unreasonable benefits from the treatment. In a prospective, population-based study of injured workers with compensable low back pain, 38% of the workers received an opioid early in their care, most at the first doctor visit ([14](#)). Among the 6% who went on to receive opioids for chronic pain for 1 year, most did not report clinically meaningful improvement in pain and function, even though their opioid dose rose significantly over the year.

Evidence-based guidelines can educate prescribers regarding the under-appreciated risks and frequently exaggerated benefits of high-dose opioid therapy. Such guidelines especially are

needed for emergency departments because persons at greater risk for overdose frequently visit emergency departments seeking drugs. Guidelines will be more effective if health system or payer reviews hold prescribers accountable for their behaviors.

A public health approach to the problem of prescription drug overdose also should include secondary and tertiary prevention measures to improve emergency and long-term treatment. Overdose "harm reduction" programs emphasize broader distribution (to nonmedical users) of an opioid antidote, naloxone, that can be used in an emergency by anyone witnessing an overdose. Efforts also are under way to increase the ability of professionals responding to emergencies to administer optimum treatment for overdoses. Substance abuse treatment programs also reduce the risk for overdose death (15). Continued efforts are needed to remove barriers to shifting such programs from methadone clinics to office-based care using buprenorphine. Office-based care can be less stigmatizing and more accessible to all patients, especially those residing in rural areas.

Washington is an example of a state that has moved aggressively to improve medical practice in opioid prescribing by developing interagency opioid-dosing guidelines.[†] The guidelines emphasize a dosing "yellow flag" at 120 mg/day morphine equivalent dose for new patients with chronic pain. The guidelines were introduced in April 2007 as a web-based tool, including 2 hours of free continuing medical education and specific "best practice" guidance, use of a patient-prescriber agreement, and judicious use of random urine drug screening. Eighteen months after introduction of the guidelines, a survey was conducted of primary-care physicians to assess overall concerns and acceptance of dosing guidance and to identify gaps in knowledge that might be addressed by new guideline tools. A majority of prescribers surveyed were not using all the best practices, likely because they did not have brief, usable tools. For example, only 38% were using random urine screens often or always, and 69% never or almost never tracked physical function. As a result, brief, open source tools such as patient questionnaires were added for ease of incorporation into routine practice. Additionally, Washington has focused on improving practitioner access to pain specialists. Specific methods are under development to offer "pain proficiency" training to primary-care prescribers, who can then become mentors/consultants to their colleagues, particularly in rural areas. In addition, the University of Washington has made twice-weekly pain consultations with a panel of specialists available. In March 2010, the Washington state legislature passed legislation that repealed permissive prescribing rules for opioids and instituted new rules largely reflective of the dosing guidance and other best practices emphasized in the guidelines.

The National Response

At the national level, the White House Office of National Drug Control Policy establishes policies, priorities, and objectives for the nation's drug control program to reduce illicit drug use, manufacturing, and trafficking; drug-related crime and violence; and drug-related health consequences. In May 2010, President Obama released the National Drug Control Strategy, which outlined the Administration's science-based public health approach to drug policy. In 2011, the strategy was expanded to place special focus on certain populations, such as service members and their families, college students, women and children, and persons in the criminal justice system.[§]

When developing a national approach to address prescription drug overdose, any policy must balance the desire to minimize abuse with the need to ensure legitimate access to these medications, and its implementation must bring together a variety of federal, state, local, and tribal groups. The Administration's plan for addressing prescription drug abuse, *Epidemic*:

Responding to America's Prescription Drug Abuse Crisis, which was released in April 2011, includes four components: education, tracking and monitoring, proper medication disposal, and enforcement.¹

The majority of health-care providers receive minimal education regarding addiction and might be at risk for prescribing an addictive medication without fully appreciating the potential risks. Therefore, the first component of the plan calls for mandatory prescriber education. This would require prescribers to be trained on appropriate prescribing of opioids before obtaining their controlled substance registration from the Drug Enforcement Administration (DEA). Parents and patients also must be educated about the dangers and prevalence of prescription drug abuse and how to use prescription drugs safely. To achieve this, the plan calls for a public/private partnership to develop an educational campaign directed at parents and patients.

The second component of the plan calls for prescription drug monitoring programs to be operational in all states and mechanisms to be in place for data sharing. As of May 2011, 35 states had operational monitoring programs, and 13 additional states had passed enacting legislation.

The third component, proper medication disposal, is essential because the public lacks a safe, convenient, and environmentally responsible way to dispose of medications that are no longer needed. DEA is drafting rules to provide easier access to drug disposal. In support of medication disposal efforts, DEA held National Prescription Drug Take-Back Events in 2010 and 2011. During the first two such events, approximately 309 tons of drugs were collected at over 5,000 sites across the country.**

The fourth component calls on law enforcement agencies to help decrease prescription drug diversion and abuse. The majority of prescribers are responsible, but unscrupulous persons continue to operate outside of legitimate medical practice. These persons must be held accountable, and the plan outlines specific actions the federal government can take to help law enforcement agencies effectively address pill mills and doctor shopping.

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* Additional information available at <http://www.namsdl.org/presdrug.htm> .

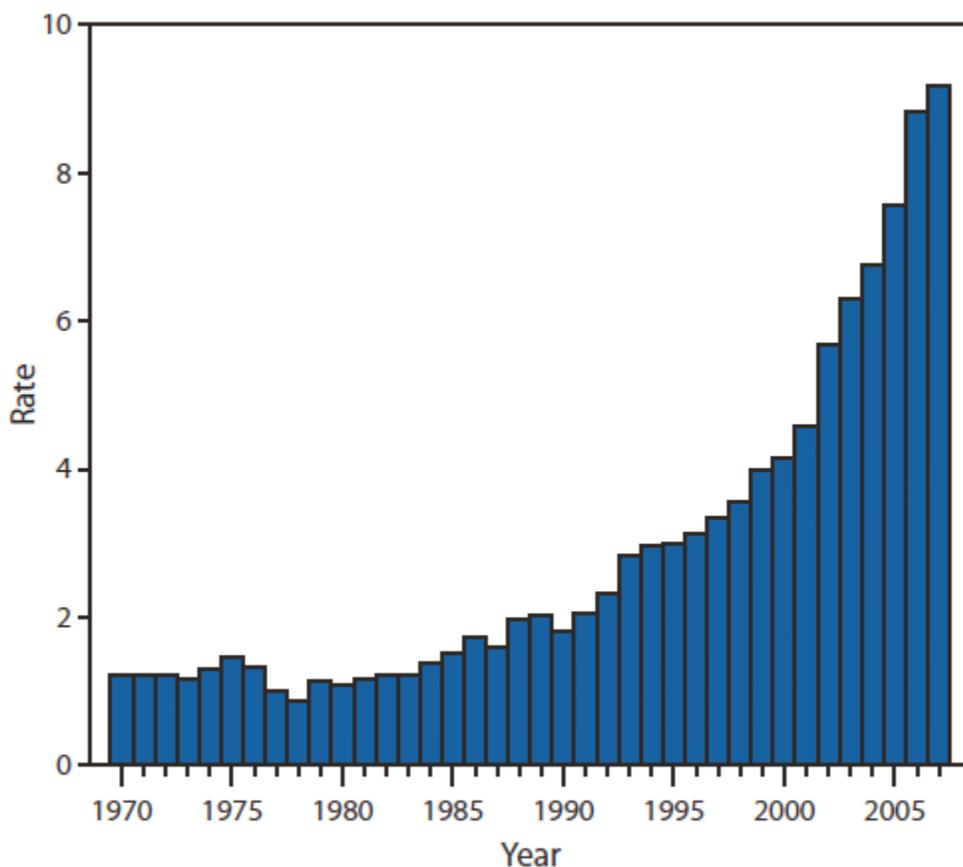
† Additional information available at <http://www.agencymeddirectors.wa.gov> .

§ Additional information available at <http://www.whitehouse.gov/ondcp/2011-national-drug-control-strategy> .

¶ Additional information available at http://www.whitehouse.gov/sites/default/files/ondcp/issues-content/prescription-drugs/rx_abuse_plan.pdf .

** Additional information available at http://www.deadiversion.usdoj.gov/drug_disposal/takeback/index.html .

FIGURE 1. Rate* of unintentional drug overdose deaths — United States, 1970–2007

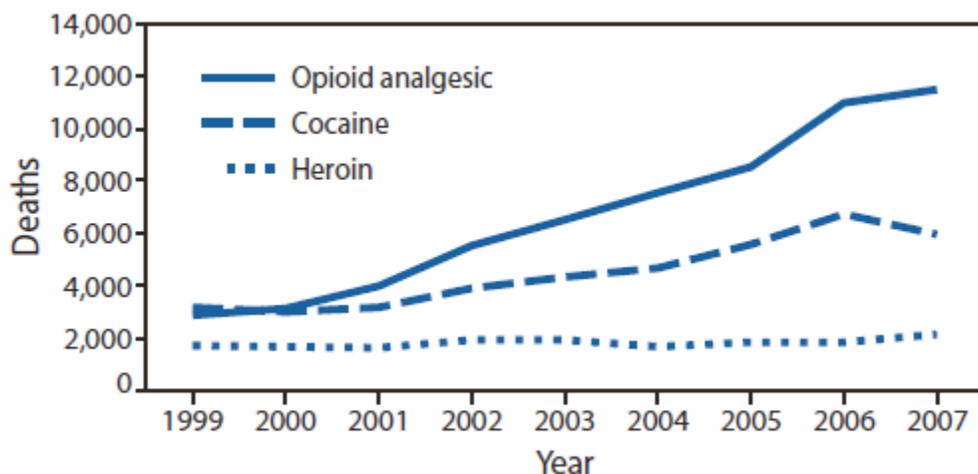


Source: National Vital Statistics System. Available at <http://www.cdc.gov/nchs/nvss.htm>.

* Per 100,000 population.

Alternate Text: The figure above shows the rate of unintentional drug overdose deaths in the United States during 1970–2007. In 2007, approximately 27,000 unintentional drug overdose deaths occurred in the United States, one death every 19 minutes. Prescription drug abuse is the fastest growing drug problem in the United States. The increase in unintentional drug overdose death rates in recent years has been driven by increased use of a class of prescription drugs called opioid analgesics.

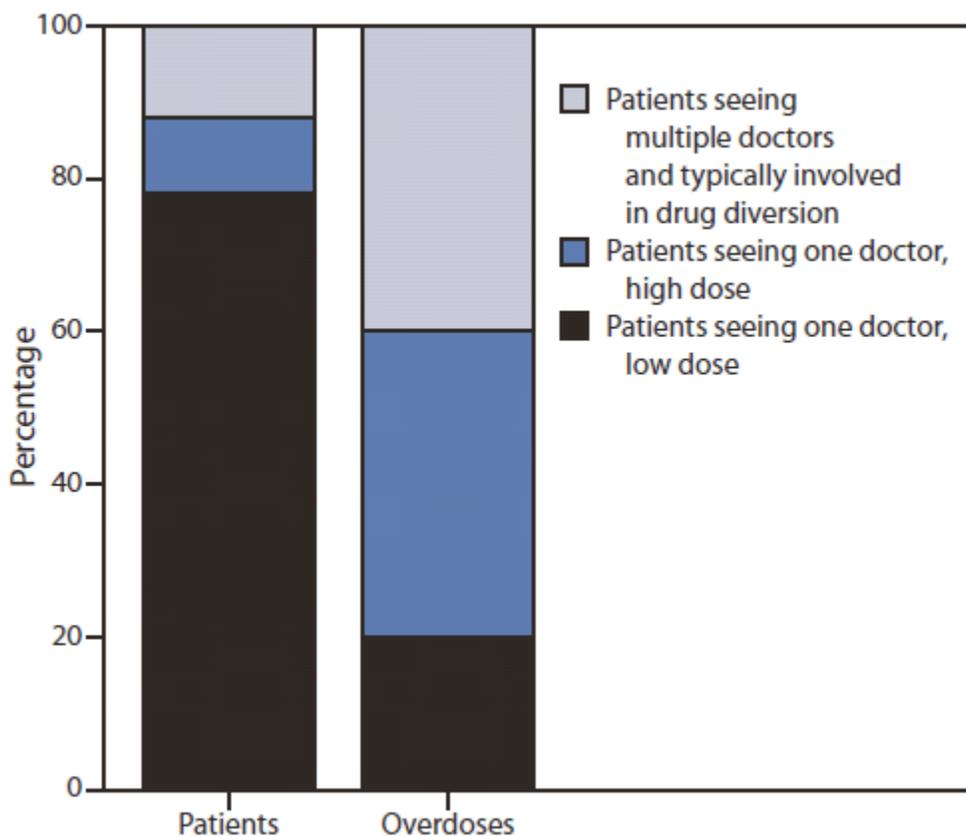
FIGURE 2. Number of unintentional drug overdose deaths involving opioid analgesics, cocaine, and heroin — United States, 1999–2007



Source: National Vital Statistics System. Multiple cause of death dataset. Available at <http://www.cdc.gov/nchs/nvss.htm>.

Alternate Text: The figure above shows the number of unintentional drug overdose deaths involving opioid analgesics, cocaine, and heroin in the United States during 1999–2007. Since 2003, more overdose deaths have involved opioid analgesics than heroin and cocaine combined.

FIGURE 3. Percentage of patients and prescription drug overdoses, by risk group — United States



Alternate Text: The figure above shows the percentage of patients and prescription drug overdoses, by risk group in the United States. Among patients who are prescribed opioids, an

estimated 80% are prescribed low doses (<100 mg morphine equivalent dose per day) by a single practitioner, and these patients account for an estimated 20% of all prescription drug overdoses. Another 10% of patients are prescribed high doses (\geq 100 mg morphine equivalent dose per day) of opioids by single prescribers and account for an estimated 40% of prescription opioid overdoses. The remaining 10% of patients seek care from multiple doctors, are prescribed high daily doses, and account for another 40% of opioid overdoses.

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