

Prescription Drug Abuse

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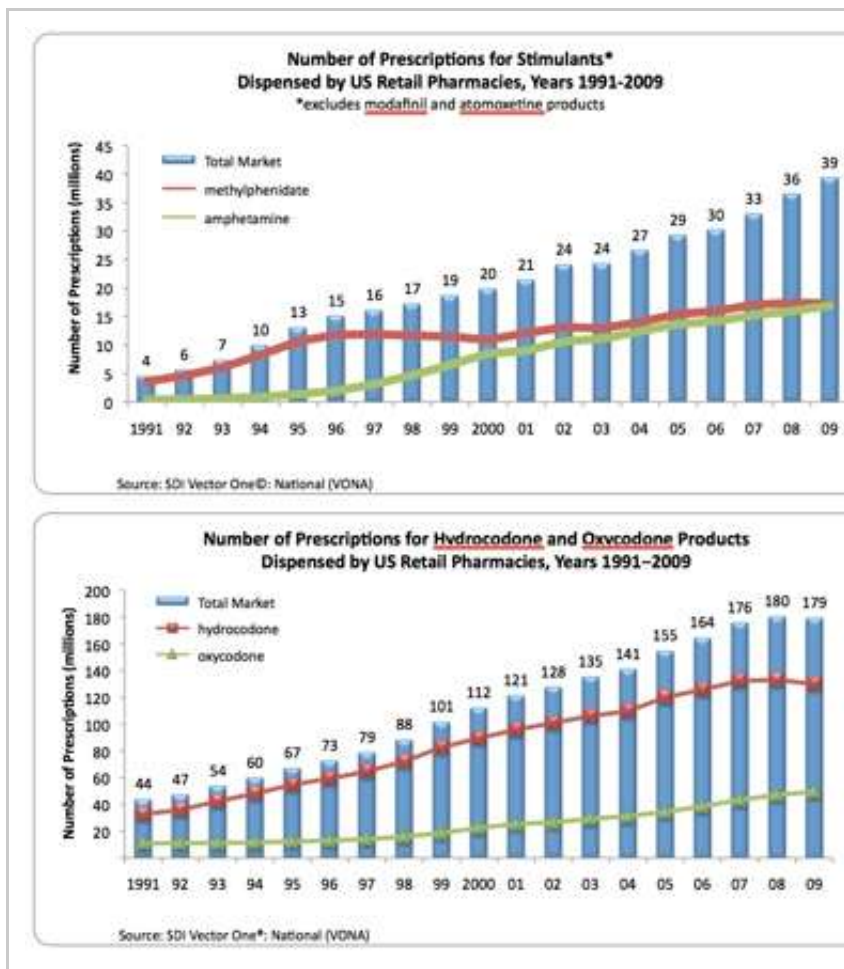
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presented by Nora D. Volkow, M.D. Director, National Institute on Drug Abuse
Health Department of Health and Human Services
Congressional Caucus

Thank you for inviting the National Institute on Drug Abuse (NIDA), a component of the National Institutes of Health (NIH), an agency of the Department of Health and Human Services, to participate in this forum and contribute what I believe will be useful insight into the public health problem of prescription drug abuse in this country.

Introduction to the Problem

In 2009, 7 million Americans reported current (past month) nonmedical use of prescription drugs—more than the number using cocaine, heroin, hallucinogens, and inhalants. Recent surveys show that the number of new abusers of several classes of prescription drugs has increased markedly in the United States in the 1990s², continuing at high rates during the 2000s. Abuse of prescription drugs now ranks second (after marijuana) among illicit drugs used, and even more disturbing, approximately 2.2 million Americans used pain relievers for the first time in 2009 (initiates of marijuana use were 2.4 million).



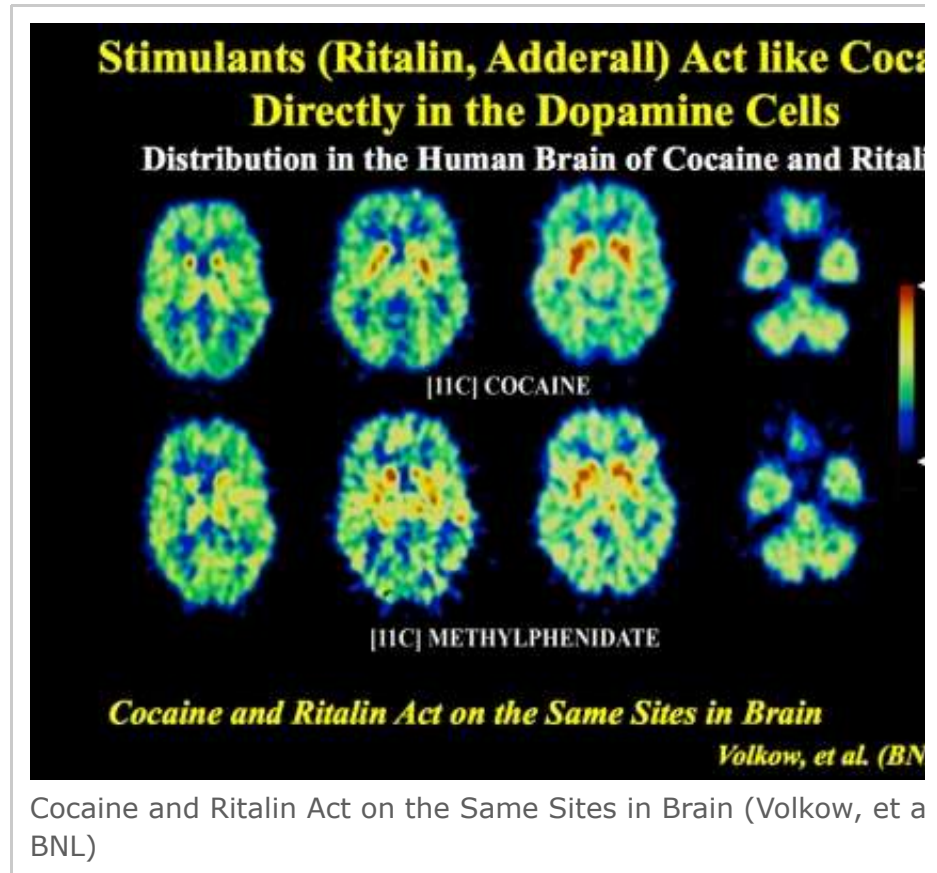
So what is behind this high prevalence and incidence? As expected, the most common factors are age, gender, and other factors⁴, which also likely include greater availability. The number of prescriptions for some of these medications has increased dramatically since 1991, more than 8-fold for stimulants, and 4-fold for opioids (figure)⁵. Other contributors include a consumer culture amenable to taking a pill for what ails you and the perception that prescription drugs are less harmful than illicit ones⁶. This is not the case: prescription drugs, whether directly or indirectly on the same brain systems affected by illicit drugs; thus, prescription drugs can lead to substantial abuse and addiction liabilities and can lead to a variety of other

NIDA therefore continues to support research to decrease prescription drug abuse by pursuing medications that have little or no addiction potential. We know our research is balanced, so that people suffering from chronic pain, attention deficit-hyperactivity disorder (ADHD), anxiety, or other illnesses can get the relief they need while minimizing

Effects on the Brain and Body

The three broad categories of psychotropic prescription drugs with abuse liabilities are analgesics, stimulants, and central nervous system (CNS) depressants. How

briefly below:



- Stimulants, prescribed for ADHD and narcolepsy, include drugs such as Ritalin, Concerta) and amphetamine (e.g. Adderall). These prescription drugs act on the central nervous system, with effects similar to but more potent than cocaine. Orally, as prescribed, these stimulants elicit a gradual and sustained increase in the neurotransmitter (brain chemical) dopamine, which produces the expected effects seen in many patients. In people with ADHD, stimulant medications generate a "focusing" effect, particularly in children. However, because these medications act on the dopamine system in the brain (the reward pathway), they are also similar to cocaine, particularly when they are taken at doses or by routes other than what is prescribed. For example, methylphenidate is similar to cocaine, in that it binds to sites in the brain, thereby increasing dopamine in reward circuits. When administered at high doses, both drugs cause a rapid and large increase in dopamine, which is expected to be high. For those who abuse stimulants, the range of adverse health consequences includes dangerously high body temperature, seizures, and cardiovascular complications.
- Opioids, mostly prescribed to treat moderate to severe pain, include drugs such as hydrocodone (e.g., Vicodin) and oxycodone (e.g., OxyContin). Opioids act on the body by attaching to specific cell surface proteins called opioid receptors in the brain, spinal cord, gastrointestinal tract and other organs. When the drug binds to certain opioid receptors, they can attenuate the perception of pain and induce

These drugs also can induce euphoria by indirectly boosting dopamine levels in brain regions that influence our perceptions of pleasure. This feeling is often intensified in people who snort or inject the drug, amplifying its euphoric effects and increasing the risk of serious medical consequences, such as respiratory arrest, coma, and death. Combining opioids with alcohol or other CNS depressants can exacerbate these consequences.

- CNS depressants, typically prescribed for the treatment of anxiety, panic disorder, acute stress reactions, and muscle spasms, include drugs such as benzodiazepines (Valium, Xanax) and barbiturates (e.g., phenobarbital)—which are sometimes used to treat seizure disorders. Most CNS depressants act on the brain by affecting the gamma-Aminobutyric acid (GABA) receptors, which works by decreasing brain activity and thereby produce a drowsy or calming effect. These drugs are also particularly dangerous when combined with other medications or alcohol; overdose can suppress respiration and lead to death. Non-benzodiazepine sleep medications, such as zolpidem (Ambien), eszopiclone (Lunesta), and zaleplon (Sonata), have a different chemical structure, but act on some of the same receptors as benzodiazepines and so may share some of the risks—they generally tend to have fewer side effects and less dependence potential.

Finally, over-the-counter (OTC) medications, such as certain cough suppressants and antihistamines, can also be abused for their psychoactive effects. Cough syrup medications are the most commonly abused OTC medications; nearly 6 percent of people reported abusing cough medicine to get high in 2009 ⁸. At high doses, dextromethorphan, an ingredient found in cough syrup—can act like PCP or ketamine, producing dissociative body experiences, and sometimes confusion, coma, and even death. Furthermore, many OTC medications often contain aspirin or acetaminophen (e.g., Tylenol), which can be toxic to the liver. Combining OTC medications with any of the prescription drug types described above can increase these dangers.

Troubling Signs of a Growing Problem

Selected indicators of the prescription drug and OTC medication abuse in this country are as follows:

- Treatment admissions for opiates other than heroin rose from 19,870 in 2008, over a 450-percent increase ⁹.
- The number of fatal poisonings involving prescription opioid analgesics rose from 1999 through 2006, outnumbering total deaths involving heroin and cocaine.
- The Drug Abuse Warning Network (DAWN), which monitors emergency department

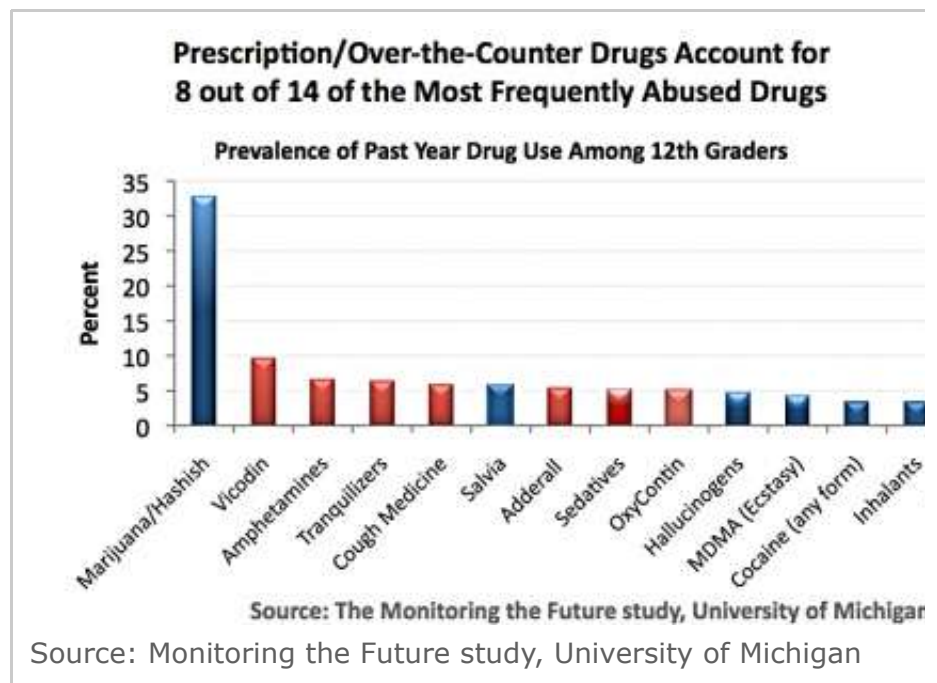
in selected areas across the Nation, estimates that in 2008, roughly 305 nonmedical use of prescription pain relievers; 19,000 involved CNS stim involved CNS depressants (anxiolytics, sedatives, and hypnotics). Over than one drug. These numbers have more than doubled for pain reliever for stimulants and CNS depressants since 2004.

- ED visits related to zolpidem (Ambien)—one of the most popular prescri benzodiazepine hypnotics in the United States—also more than doubled from about 13,000 in 2004 to about 28,000 in 2008.

Trends in Prescription Drug Abuse—Who Is Abus

Latest trends show that adolescents and young adults may be especially vul drug abuse, particularly opioids and stimulants.

Data from the 2009 National Survey on Drug Use and Health (NSDUH) indic prescription drug use were highest among young adults 18 to 25, with 6.3 p nonmedical use in the past month ¹¹. That said, earlier data on past-year *u* psychotherapeutic drug, prevalence of dependence or abuse is higher for th group than for young adults (15.9 vs. 12.7 percent) ¹². In this youngest ag exceed males in the nonmedical use of *all* psychotherapeutics, including pai tranquilizers, and stimulants, and are more likely to be dependent on stimul



Moreover, according to the Monitoring the Future survey (MTF), prescription drugs comprised 8 of the top 14 categories of drugs abused by 12th graders

many medications can be abused, opioids display particularly disturbing abuse patterns, for example, that the rate of nonmedical use of Vicodin and OxyContin has remained unchanged for several years, with nearly 1 in 10 high school seniors reporting the former and 1 in 20 of the latter ¹⁴.

Also of concern is the diversion of stimulants, particularly ADHD medications. Studies show that many people are using them to increase alertness and stay awake to study ¹⁵. The growing number of prescriptions written for this diagnosis has led to dramatically greater availability of these medications with potential for diversion. For those who take these medications for diagnosed mental disorders, they can markedly enhance a patient's quality of life. However, prescription stimulants are increasingly being abused for nonmedical conditions (such as to get high; as a cognitive enhancer), which poses potential health risks, including cardiovascular events, and psychosis ¹⁶.

Why Do They Do It?

The far-ranging scope of prescription drug abuse in this country stems not only from the over-prescribing of medications, but also from misperceptions of their safety when used as directed by someone other than the prescription recipient. Among the latter, many people use these drugs for their intended purposes, such as to relieve pain in the case of prescription opioids, to enhance alertness in the case of ADHD medications but without a doctor's supervision. Many college students and even some parents see nothing wrong in the abuse of stimulant medications to improve function and academic performance. In fact, being in college may even be a contributing factor to the use of amphetamines or methylphenidate nonmedically, with reports of students using these drugs to pass tests and of those with prescribed medications being approached to divert their supply. Research also shows a similar link with regard to access, evidence also suggesting that parents often give their children with prescription medications to relieve their discomfort. When asked where their prescription narcotics (opioids) were obtained for nonmedical use, more than 50% of respondents said they were given the drugs or bought them from a friend or relative ¹⁸.

Nonmedical use among children and adolescents is particularly troublesome because adolescence is the period of greatest risk not only for drug experimentation but also for the development of mental health problems. At this stage the brain is still developing, and exposure to drugs could interfere with the normal orchestrated changes. Research also shows adolescents abusing prescription drugs are more likely to have engaged in delinquent behavior and nearly three times as likely to experience an episode of major depression as teens who did not abuse prescription medications in the past year. Finally, several studies link the illicit use of prescription drugs with increased rates of smoking, heavy drinking, and marijuana and other illicit drug use in adolescents in the United States. Thus, prescription drug abuse may be part of a pattern of substance use engaged in by those at risk for substance use and other mental disorders.

Older adults represent another area of concern. For although this group currently represents only 15 percent of the population, they account for more than one-third of total outpatient prescription medications in the United States ¹⁹. Older patients are more likely to have long-term and multiple prescriptions, which could lead to misuse (i.e., *unintentional* use of prescription medication other than how it was prescribed) or abuse (i.e., *intentional* misuse).

Various reasons underlie why older adults may misuse or abuse prescription medications. Cognitive decline, combined with greater numbers of medications and complicated drug regimens, can lead to unintentional misuse. Alternatively, those on a fixed income may intentionally misuse a person's remaining medication to save money. Because older adults also experience other illnesses as well as normal changes in drug metabolism, it makes sense that abuse or unintentional misuse of prescription drugs by elderly persons could have serious health consequences. Therefore, physicians need to be aware of the possibility of misuse and discuss the health implications with their patients and/or their caretakers.

Intervening with Prescription Drug Abusers: Difficult Challenges and Approaches Needed

Because they can greatly benefit health as well as pose risks, prescription drugs present unique challenges in how best to guard against their abuse. A nuanced approach is needed for particular user groups and their varied motivations. For patients and their doctors, these challenges quickly become complex and difficult to manage, as physicians may need to balance a patient's presenting symptoms indicates a need to increase the dose of an opioid analgesic to manage pain, or signal a potential drug abuse problem.

By asking about *all* drug abuse, physicians can help their patients recognize their own risks, set recovery goals, and seek appropriate treatment. More than 80 percent of patients in contact with a health care professional in the past year ²⁰, placing them in a position where physicians not only to prescribe medications, but also to identify potential problem use of prescription drugs to prevent it from escalating to abuse and addiction. Screening for prescription drug abuse should be incorporated into routine medical visits, with brief interventions or referrals to specialized care for them. To that end, NIDA has recently deployed **NIDAMED**, a physician outreach program that includes user friendly online tools designed to help primary-care physicians identify and address alcohol, tobacco and illicit and nonmedical prescription drug use.

And while preventing or stopping prescription drug abuse is an important part of patient care, healthcare providers should not avoid prescribing stimulants, CNS depressants, or pain relievers if needed. Underprescribing opioid pain relievers, such as hydrocodone,

result in needless suffering and diminished quality of life for patients with le For their part, patients can take steps to enÂsure that they use prescription appropriately, and always discuss any and all drug use, including prescriptio with their doctors.

What NIDA is Doing

To stay abreast of who is using and why, NIDA-supported researchers contin information about the latest trends through large-scale epidemiological stud patterns and sources of nonmedical use, particularly in high school and colle years are often when young people initiate or increase their abuse of prescr Identifying trends as soon as they begin to surface in the population helps N the effort to surmount increasing abuse.

With the growing elderly population and the many returning injured veteran better understand how to effectively treat people with chronic pain, which fa someone to become addicted to prescription pain relievers, and what can be among those at risk. NIDA is bolstering efforts to test and evaluate interven prescription drug abuse, tailoring them according to type of medication and NIDA will continue to use a multi-pronged strategy intended to complement already robust portfolio of basic, preclinical, and clinical research and educa initiatives to ameliorate the prescription drug phenomenon.

Medications Development

NIDA is leading efforts in the treatment of addiction to prescription pain relie discovery of effective medications for pain (with less abuse potential) and fo health priority. In this regard, the following show promise:

- *Pain medications that do not act through opioid receptors.* Compounds t cannabinoid type 2 receptors, located largely outside of the brain, have acute, inflammatory, and neuropathic pain. Similarly, non-neuronal brain have recently been shown to play a key role in pathological pain states a novel target for pain medications.
- *Suboxone—a buprenorphine/naloxone combination—a medication devel to treat opioid addiction.* It reduces cravings, withdrawal symptoms, and patients—and it can be prescribed by certified physicians in an office set suggests that it may also provide pain relief, but with diminished abuse safety margin than some other pain medications.

- *Depot, or long-acting, formulations of medications, including naltrexone*
These versions lend to better compliance because their effects can last for hours or days (e.g., one dose can last 6-8 weeks). Thus, patients do not have to take themselves daily to stick to a treatment regimen, and sustained-release medications decrease the potential for diversion and abuse, since there are no take-home medications. A depot form of naltrexone, already approved for alcohol use, has shown a remarkable promise in clinical trials for heroin addiction, increasing abstinence, retention, and decreasing craving. Further research is needed to determine the effectiveness of these medications in treating addiction to opioid pain medications.

Unfortunately, at this time, there are still no medications proven effective for treating addiction. However, NIDA is supporting a number of studies on medications in this regard.

Education and Outreach

Education is a critical component of any effort to curb the abuse of prescription drugs. It must target every segment of society. Because prescription drugs are safe when used properly and are broadly marketed to the public, the notion that they are addictive when abused can be a difficult one to convey. Along with advancing prevention, and treatment in primary care practices through our NIDAMED initiative, we are continuing the work of its Centers of Excellence for Physician Information to reach out to physicians-in-training from diverse specialties. NIDA is also reaching out to a new initiative known as PEERx, created to provide educators, mentors, student leaders, and other professionals with science-based information about the harmful effects of prescription drug abuse on the individual and the body. In a more general vein, we will continue our close collaborations with the Office of Drug Control Policy (ONDCP), the Substance Abuse and Mental Health Services Administration (SAMHSA) and other Federal agencies, as well as professional associations and state agencies in preserving public health.

Conclusion

Prescription drug abuse is not a new problem, but one that deserves renewed attention. It is an imperative that as a Nation we make ourselves aware of the consequences of these medications. For although prescription drugs can be powerful allies in the treatment of many health risks related to their abuse, which can lead to addiction and to death, we must find a balance so that people suffering from chronic pain, ADHD, or anxiety can get the relief they need while minimizing the potential for abuse.

Consistent with NIDA's mission, our response has been framed by our commitment to what we know from research to help the public better understand drug abuse and to develop more effective strategies for their prevention and treatment.

References

*The terms "prescription drug abuse" and "nonmedical use" are used interchangeably in this document and are based on the definitions used by most national surveys of prescription drug use (i.e., the intentional use of an approved medication *without* a prescription or in a manner other than how it was prescribed, for purposes other than prescribed, or for the effects that the medication can produce). Misuse refers to *unintentional* use of an approved medication other than how it was prescribed.

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² SAMHSA (2003). *Results from the 2002 National Survey on Drug Use and Health* (Office of Applied Studies, NHSDA Series H-22, DHHS Publication Number 03-3012). Rockville, MD: SAMHSA.

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⁵ Source: SDI's Vecton One®: National.

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¹² See Tables 6.4 A and 6.4 B <http://oas.samhsa.gov/prescription/AppD.htm>

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