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Understanding and Detecting Prescription Drug Misuse and Misuse Disorders

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This fact sheet is designed for court professionals. It describes prescription drug misuse and provides information on:

- The attributes of the most commonly misused and addictive prescription drugs
- The extent and consequences of misuse
- Side effects and toxicity
- Characteristics of those who are most likely to misuse prescription drugs
- Signs and symptoms of misuse
- Ways to identify and treat those who may have developed a drug use disorder, including a section on medication-assisted treatment of opioid use disorder
- Educational and technical assistance resources on this topic from SAMHSA and other organizations

Prescription Drug Misuse and the Most Commonly Misused Drugs

The Substance Abuse and Mental Health Services Administration (SAMHSA) defines nonmedical prescription drug misuse as the use of prescription pain relievers, tranquilizers, stimulants, sedatives, and other prescription drugs in a way other than prescribed, such as for perceived medical need or for the feeling the drug causes (SAMHSA, 2012). This definition covers a wide range of behaviors, from using someone else's medication to address a legitimate medical need to misusing prescription medications to stay awake, get to sleep, calm down, enhance job or athletic performance, or change one's mood.

People who misuse prescription medications may not understand that, although drugs for treating pain and other medical conditions are generally safe when taken as prescribed, they

Table 1. Commonly Misused Opioids and Their Applications		
Generic name	**Brand name(s)**	**Used to treat**
oxycodone	OxyContin, Percodan, Percocet, Roxicet, Tylox	Acute and long-term pain relief
hydrocodone	Lorcet, Lortab, Vicodin, Vicoprofen	Acute and long-term/ chronic pain relief
hydromorphone	Dilaudid	Pain relief
morphine	Astramorph, Avinza, Duramorph, Kadian, MS Contin, Roxanol	Post-surgical pain relief
codeine	various	Pain relief, cough, diarrhea

can be dangerous if they are not prescribed for the person taking them or not taken as prescribed by their health care provider.

A national survey conducted in 2013 shows that prescription drug misuse is a serious public health problem. Approximately 6.5 million (2.5%) of Americans aged 12 years and older admitted to using prescription drugs nonmedically in the past month (SAMHSA, 2014b). Nonmedical prescription use is especially common among those with chronic pain, teenagers and young adults, and those with a history of addiction or other mental health problems, such as depression and anxiety (Compton & Volkow, 2006).

Prescribed medications that are commonly misused in an ongoing or dangerous manner are called *psychoactive drugs*, as they all affect the brain and can have a profound effect on mental states and processes. The most commonly misused types of medications are central nervous system depressants ("downers"), which include both opioids and sedative-hypnotics (tranquilizers and sedatives; Manchikanti, 2006). A third class of drugs—central nervous system stimulants ("uppers")—are also commonly misused.

Opioid Pain Relievers

Opioids are the most commonly misused prescription drugs. They act on the limbic system (which controls emotions), the brain stem (which controls autonomic body functions), and the spinal cord (which receives sensory information from the body). As shown in Table 1, medications in this class include hydrocodone (e.g., Vicodin), oxycodone (e.g., OxyContin, Percocet), morphine (e.g., Kadian, Avinza), codeine, and related drugs. Hydrocodone products are the drugs most commonly prescribed for a variety of painful conditions, including acute injuries and dental procedures, as well as chronic conditions, such as cancer and arthritis. Morphine is often used before and after surgical procedures to alleviate severe pain. Codeine, a milder pain reliever, is often prescribed for less severe pain. In addition to their pain-relieving properties, some of these drugs—codeine and diphenoxylate (Lomotil), for example—can be used to relieve coughs and severe diarrhea (National Institute on Drug Abuse [NIDA], 2014).

Opioid painkillers reduce pain often without eliminating its cause. They produce sedation, euphoria, and respiratory depression, and they slow gut function, which frequently leads to constipation.

Peak effects generally are reached in 10 minutes if taken intravenously, 30 to 45 minutes with an intramuscular injection, and 90 minutes by mouth. The absorption of toxic doses by mouth may take longer because the retarding of gut movement delays drug absorption.

Extent and Consequences of Misuse

Since 2003, more overdose deaths have involved prescription opioids than heroin. This epidemic parallels the huge increase in the number of prescriptions written for opioid medications over the past decade. Enough is prescribed annually to give every person in the United States a typical 5 mg dose of Vicodin (hydrocodone and acetaminophen) every four hours for three weeks. ***A Nation in Pain,*** a report published by Express Scripts (2014), analyzes prescription opioid use in the U.S. from 2009 to 2013. Although the number of Americans using pain medications long term did not increase over this period, the volume of pain medication sold increased significantly.

Nearly half of patients who took opioid pain relievers for more than 30 days in their first year of use continued to use, or misuse, the drugs for three years or more. Almost 50% of these patients were taking only short-acting opioids, putting them at higher risk for problematic use. Two-thirds of patients on these medication mixtures were prescribed the drugs by two or more physicians, and nearly 40% filled their prescriptions at more than one pharmacy. In addition to opioids, nearly one in three patients were taking benzodiazepines, 28% were taking muscle relaxants, and 8% were combining all three. Additionally, 27% were taking multiple opioid pain treatments at the same time. Small southeastern cities had the highest rates of pain medication use (Express Scripts, 2014).

In response to the epidemic of opioid-related overdose deaths, manufacturers have reformulated some of the commonly prescribed opioids to deter abuse. Moreover, the public health community has responded to the issue by educating physicians, implementing prescription monitoring programs, modifying drugs to reduce their potential for misuse, and reducing online sources of prescription opioids (CDC, 2007). The abuse-deterrent reformulation of OxyContin, combined with many environmental interventions, has led to reduced availability of the most desired non–abuse deterrent formulations. Unfortunately, prescription opioid misusers are increasingly switching to or supplementing with heroin, in part due to actions against "doctor shoppers" and "pill mills." Heroin often is readily available and costs much less than prescription opioids (Unick, Rosenblum, Mars, & Ciccarone, 2013).

Side Effects and Toxicity of Opioids

The chief hazard associated with opioid painkillers is respiratory depression (Teater, 2015). These medications are dangerous because the difference between the amount needed to feel the effects and a fatal dose is small and unpredictable. Other drugs—such as alcohol, tranquilizers, barbiturate sedatives (found in sleeping pills and anti-anxiety medications), and some muscle relaxants that cause drowsiness (especially carisoprodol [Soma]; Jenkins et al., 2011)—increase the respiratory depression caused by opioids. So if someone takes their usual dose of opioids, but adds alcohol or tranquilizers, they may pass out, stop breathing, and die.

Opioids are broken down in the body into harmless compounds over time, but the time differs by drug. As a result, mixing extended-release and long-acting opioids can be deadly. And the pain-relieving and euphoria-inducing aspect of opioids may wear off sooner than the respiratory-depressant effect.

Signs of opioid overdose include slowed, obstructed, or stopped breathing; sleepiness progressing to stupor or coma; weak, floppy muscles; cold and clammy skin; pinpoint pupils; slow heart rate; dangerously low blood pressure; and death. Sudden lung injury, uncontrollable seizures, and heart damage can also occur, although less commonly.

Tolerance is a universal effect of opioids and other drugs that leads to a need for increasing dosages to maintain the drug's effects. It quickly develops into physiological dependence leading to a withdrawal syndrome, unless the patient gradually tapers down. This process can occur in any opioid user—those who take opioids post-operatively for pain relief as well as persons who misuse them illicitly. Once tolerant and dependent, many chronic users may have a hard time stopping due to the physiological withdrawal symptoms. However, this does not mean such a person has developed an

Common Signs of Opioid Overdose

- Slowed, obstructed, or stopped breathing
- Sleepiness progressing to stupor or coma
- Weak, floppy muscles
- Cold and clammy skin
- Pinpoint pupils
- Slow heart rate
- Dangerously low blood pressure

opioid use disorder (the term now used in place of ***abuse*** or ***dependence***).[1] Opioid use disorder is characterized by additional symptoms.[2]

People who are chronic opioid users feel less effect per given dose—and their bodies can tolerate more of the drug—than their nonusing counterparts. A common overdose death scenario among those who take opioids to get high occurs when, due to tolerance, they increase the dose to get a rush, not realizing they are not tolerant to the respiratory-depression effects. The biological mechanisms of tolerance are complex. Different forms of tolerance have different mechanisms of action. In addition, tolerance may not be the same for different opioids.

Other adverse effects of opioids include risk of physiological dependence and opioid use disorder, cognitive impairment, reduced levels of sex hormones, brain (neuronal) changes, impaired healing, reduced body or muscular coordination, and exacerbation of obstructive sleep apnea symptoms.

Another adverse effect of the chronic use of opioids is that, when taken for long periods, opioids may actually ***increase*** the body's perception of pain. This can lead to a feedback loop: need for higher and higher doses, creating more and more risk of overdose while also increasing pain.

Finally, opioid use affects an unborn fetus. Opioids pass through the placenta and can cause birth defects and behavioral problems in babies born to women who have used these drugs during their pregnancy, even if they used them as prescribed. Birth defects that can be caused by opioids include spina bifida (brain or spinal cord abnormalities), heart defects, and glaucoma (American Congress of Obstetricians and Gynecologists [ACOG] Committee on Health Care for Underserved Women, 2012; Broussard et al., 2011). Babies born to mothers who use opioids during their pregnancy may be physically dependent on the drugs and show withdrawal symptoms after birth. This is called neonatal abstinence syndrome (NAS). Symptoms of NAS include low birth weight, respiratory problems, feeding difficulties, seizures, excessive crying and sucking, tremors, vomiting, breathing problems, disturbed sleep, sweating, irritability, and fever (ACOG, 2012; U.S. National Library of Medicine, n.d.).

Pregnant women who have been misusing opioids regularly must undergo opioid replacement therapy with methadone or buprenorphine, since stopping use will cause the fetus to experience potentially fatal withdrawal symptoms. Both buprenorphine and methadone have been deemed safe for opioid addiction treatment of pregnant women, although the babies often will be born with NAS and must be gradually weaned off the drug (ACOG, 2012). NAS symptoms appear to be milder with buprenorphine (Jones et al., 2010; Unger et al., 2011).

[1] "Substance use disorder in DSM-5 combines the DSM-IV categories of substance abuse and substance dependence into a single disorder [drug use disorder] measured on a continuum from mild to severe. Each specific substance . . . is addressed as a separate use disorder (e.g., alcohol use disorder, stimulant use disorder, etc.), but nearly all substances are diagnosed based on the same overarching criteria" (APA, 2013b).

[2] DSM-5 contains an extensive list of symptoms. Having two or three symptoms over a 12-month period is classified as mild disease; four to five symptoms, moderate disease; and six or more symptoms, severe disease. The physical dependence and drug withdrawal criteria are not considered to be met for those individuals taking opioids only as prescribed under appropriate medical supervision (APA, 2013a).

Understanding and Detecting Prescription Drug Misuse and Misuse Disorders

Who Is Most at Risk of an Opioid Overdose?

The two main populations in the United States at risk for prescription drug overdose are the approximately 9 million people who report long-term medical use of opioids and the roughly 5 million who report nonmedical use (i.e., use without a prescription or medical need) in the past month (CDC, 2012). Those at particularly high risk include people taking opioid medications for the first time; those taking multiple forms of opioids or who mix them with alcohol, barbiturates, or tranquilizers; and those with sleep apnea, heart failure, obesity, severe asthma, or respiratory conditions (Webster et al., 2011). In the U.S., overdose deaths most commonly result from combinations of substances—mixtures of opioids, alcohol, benzodiazepines, sedatives, stimulants, and cannabis, with the combination of benzodiazepines plus opioids being particularly toxic (Jones, Mogali, & Comer, 2012).

The following populations are especially vulnerable to prescription opioid overdose (National Center for Injury Prevention and Control, 2011):

- People who obtain multiple controlled substance prescriptions from multiple providers—a practice known as doctor shopping.
- People who take high daily dosages of prescription painkillers and those who misuse multiple abuse-prone prescription drugs.
- Low-income people on Medicaid and those living in rural areas. People on Medicaid are prescribed painkillers at twice the rate of non-Medicaid patients and are at six times the risk of prescription painkiller overdose.
- People with mental illness and those with a history of substance abuse.

Who Is Most at Risk of an Opioid Use Disorder?

The main risk factors for developing an opioid use disorder in the general population are also the most obvious: a history of substance addiction and a history of other psychiatric disorders, particularly mood or anxiety disorders (Sullivan, Edlund, Zhang, Unützer, & Wells, 2006). The risk factors for opioid misuse among those taking opioids for chronic pain include youth, past cocaine use, drug or impaired driving conviction, and past alcohol use disorder or heavy use (Ives et al., 2006).

Medication-Assisted Treatment of Opioid Use Disorders

Some 12 million people reported using prescription painkillers nonmedically in 2010 (SAMHSA, 2011). Of these, an estimated 15% qualify for a diagnosis of opioid use disorder and would benefit from treatment. Nevertheless, medication-assisted treatment (MAT) has been used in fewer than half of treatment facilities (Knudsen, Abraham, & Roman, 2011).

What Is MAT?

Medication-assisted treatment is a corrective—but not a curative—treatment for opioid use disorder. The most effective MATs used to treat opioid use disorder are methadone (Dolophine, Methadose) and buprenorphine (Suboxone, Zubsolv). Although they are classified as opioids, these long-acting medications, when taken as prescribed, do not get the person taking them high. Like other opioids, they bind to the body's natural opioid receptors, but they are less addictive. When taken appropriately, methadone and buprenorphine can help those in therapy feel normal and live normal lives. For optimal results, patients should also participate in a comprehensive treatment program that includes counseling and social support (SAMHSA, 2015a).

People taking methadone to treat opioid addiction must receive the medication under the supervision of a physician. By law, methadone can be dispensed only through an opioid treatment program certified by SAMHSA. After a period of stability (based on progress and proven, consistent compliance with the medication dosage), patients may be allowed to take methadone at home between program visits (SAMHSA, 2015c).

Unlike methadone treatment, buprenorphine may be prescribed and dispensed in physician offices, significantly increasing treatment access. It is the first medication for treating opioid use disorder that can legally be dispensed in this way. Under the Drug Addiction Treatment Act of 2000, qualified U.S. physicians can offer buprenorphine for opioid use disorder in their offices, community hospitals, health departments, and correctional facilities (SAMHSA, 2015b). Buprenorphine has a high affinity to the opioid receptors; thus, it occupies the receptors at relatively low doses. As a result, it prevents someone from going into opioid withdrawal but not necessarily at a dose that triggers an opioid high.

Because methadone and buprenorphine are opioids, some see prescribing them as "giving drugs to drug addicts." This is not the case. These drugs relieve narcotic craving, prevent symptoms of opioid withdrawal, and block the euphoric effects associated with heroin and other more powerful narcotic medications (Joseph, Stancliff, & Langrod, 2000). The medications are usually prescribed on an ongoing basis, similar to taking a medication for high blood pressure.

Effectiveness of these interventions is currently well documented in literature reviews by established researchers and clinicians (Volkow, Frieden, Hyde, & Cha, 2014). Nonetheless, because these medications are opioids, they can be misused, particularly by people who are not tolerant to the drugs' effects. Naloxone[3] is added to buprenorphine to decrease the likelihood of diversion and misuse of the combination drug product. When these products are taken as sublingual tablets, buprenorphine's opioid effects dominate, while naloxone blocks opioid withdrawal. If the sublingual tablets are crushed and injected, however, the naloxone effect dominates and can bring on opioid withdrawal.

Other medications approved to treat opioid use disorders include oral naltrexone (ReVia, Depade) and naltrexone sustained-release injection (Vivitrol). Naltrexone binds strongly to the body's opioid receptors and reverses the effects of opioids. This reduces opioid use because people taking these medications don't get high if they do use opioids.

A person must stop taking opioids before being prescribed naltrexone. Those who take short-acting naltrexone as directed do not relapse, but most either refuse to take it or discontinue use. The sustained-release form of naltrexone is administered once a month, which may increase adherence to treatment and may work well in court-supervised care. Without outside supervision, six-month treatment retention rates following treatment with sustained-release naltrexone are lower than one-year retention rates in methadone maintenance (Bart, 2011). Therefore, reviews of controlled studies conclude that more evidence is needed to justify its use. Those highly motivated to comply with treatment, such as employees under a treatment plan or people taking the extended release form under court supervision, can do well ("Treating opiate addiction," 2005).

Benefits of MAT

MAT has proven effective in helping patients recover from opioid addiction. When prescribed and monitored properly, methadone and buprenorphine are safe and cost-effective, and greatly reduce the risk of overdose (Schwartz et al., 2013). Other benefits include:

- Reduced likelihood of relapse
- Improved social functioning
- Lower risks of infectious-disease transmission through avoidance of illicitly obtained injectable drugs
- Reduced criminal activities, as money is no longer needed to support an addiction

In 2014, the directors of the National Institute on Drug Abuse within the National Institutes of Health, the Centers for Disease Control and Prevention, and SAMHSA, as well as the chief medical officer for the Center for Medicaid and Children's Health Insurance Program Services at the Centers for Medicare and Medicaid Services, jointly urged increased use of MAT in treating opioid use disorders. They stated that, compared to behavioral therapy alone, MAT was cost-effective, reduced criminal behavior, improved social functioning, and for some medications, increased treatment retention (reduced relapse). MAT generally begins in conjunction with behavioral therapy (Volkow et al., 2014).

[3] Naloxone is an opiate receptor blocker that cannot be absorbed through the gastrointestinal tract. A potentially lifesaving drug, naloxone is also used intravenously or as a nasal spray to treat opioid overdose.

Underutilization of MAT

The following barriers contribute to low access to and utilization of MATs (Matusow et al., 2013; Volkow et al., 2014):

- Many believe (mistakenly) that MATs merely replace one addiction with another.
- The number of trained prescribers is insufficient, leading to improper dosing of MAT and treatment failure.
- Many treatment-facility managers and staff members favor an abstinence (no-medication) model. However, opioid replacement retains patients in treatment and decreases heroin use better than treatments that do not use MAT (Mattick, Breen, Kimber, & Davoli, 2009).
- Policy and regulatory barriers are sometimes imposed by Medicaid programs or their managed-care organizations that reduce use of MATs. These include limits on dosages prescribed, annual or lifetime medication limits, initial authorization and reauthorization requirements, minimal counseling coverage, and "fail first" criteria, which require that other therapies be attempted first (Rinaldo & Rinaldo, 2013).
- Although most commercial insurance plans cover buprenorphine treatment (Volkow et al., 2014), coverage may be limited.
- Private insurance plans that provide coverage for the long-acting injection formulation of naltrexone are limited. Most plans do not cover methadone when it is provided through opioid treatment programs.

As stated recently by the federal leaders of response to opioid use disorders, "Expanding access to MATs is a crucial component of the effort to help patients recover [from opioid use disorders]. It is also necessary, however, to implement primary prevention policies that curb the inappropriate prescribing of opioid analgesics—the key upstream driver of the epidemic—while avoiding jeopardizing critical opioid treatment when it is needed" (Volkow et al., 2014).

Reversing Opioid Overdose with Naloxone

Overdose, largely from opioid drugs, is the leading cause of injury death for Americans aged 25 to 64 years (CDC, 2015). As mentioned previously, overdose kills by depressing breathing, and naloxone reverses opioid overdose toxicity by displacing opioids from their binding sites. It is available in injection form and as a nasal spray, and the only indication for its use is opioid overdose. It rapidly revives a person who is unconscious or losing consciousness from overdose, but the person typically revives in need of medical attention for acute opioid withdrawal.

In a rapidly growing number of states, it is now legal to prescribe naloxone to opioid users or, in some states, even dispense it to them with a pharmacist-issued prescription, provided they and their families and friends have been trained in its use by the prescriber or dispenser. Other states have authorized police to carry naloxone, resulting in thousands of overdose reversals.

In states that permit naloxone to be carried on one's person, a consensus is emerging that it should be available in all households where anyone is using opioids regularly, using them without medical supervision, or in danger of relapsing into opioid use. Their family members and friends should be trained to use naloxone. Former opioid users leaving incarceration are at especially high overdose risk (Merrall et al., 2010), and many people argue they should leave with naloxone in hand where that is legal. Drug courts supervising people with a history of opioid misuse or prescribed long-term use need to be aware of their state's law governing naloxone and should encourage its prescription where indicated.

Too often, people do not seek medical assistance when an overdose occurs for fear of being arrested for drug use, drug possession, or other drug-related crimes. To address this, some states have enacted overdose immunity laws intended to reduce the number of overdose-related deaths by encouraging people to seek help. These "Good Samaritan" laws related to drug overdoses fall into two primary categories. The first encourages calling 911 to seek medical assistance for someone experiencing an overdose by providing criminal immunity for both the person in need and the person who sought help. The second provides varying levels of criminal or civil immunity for those involved with the prescription, possession, or emergency administration of naloxone to reverse the effects of the overdose (National Conference of State Legislatures, 2015).

Tranquilizers and Sedatives (Sedative-Hypnotics)

While tranquilizers and sedatives (sedative-hypnotics) represent different drug classifications, they have similar side effects and are prescribed for similar medical conditions; therefore, they are discussed together here (see Table 2). Tranquilizers calm and relieve anxiety. The first tranquilizer, chlordiazepoxide hydrochloride (brand name: Librium), received FDA approval in 1960. Tranquilizers range in potency from mild to major, with increasing levels of drowsiness occurring as potency increases. They are prescribed for a wide variety of conditions but are used primarily to treat anxiety, insomnia, and alcohol withdrawal.

Most tranquilizers are potentially addictive, particularly those in the benzodiazepine (BZD) family. Common BZDs include lorazepam (Ativan), oxazepam (Serax), clonazepam (Klonopin and Rivotril), alprazolam (Xanax), diazepam (Valium), and clorazepate (Tranxene). Commonly available sleeping pills include zolpidem (Ambien) and zopiclone (Imovane). The different BZDs have very similar actions; differences are related to duration of action, depending on their metabolic half-life and the presence or absence of certain active metabolites.

The sedative category includes barbiturates, also called "barbs" or "downers." They are used primarily for sedation and to treat insomnia. Commonly misused barbiturates are secobarbital (Seconal) and pentobarbital (Nembutal). A few sedative-hypnotics do not fit in either category. They include meprobamate (Miltown, Equanil, Meprospan).

Extent and Consequences of Misuse

Lifetime prevalence of nonmedical prescription drug use and drug use disorders for sedatives is estimated at 3.0% to 4.1% (Center for Behavioral Health Statistics and Quality, 2015; Huang et al., 2006). Sedative use and misuse are associated with psychopathology and suicide risk. Parental misuse of prescription medications is a strong predictor of sedative misuse (Goodwin & Hasin, 2002).

The prevalence of past-year nonmedical use of sedative-hypnotics in the United States was 2.3%. Of those with nonmedical use, 9.8% met criteria for use disorders (Becker, Fiellin, & Desai, 2007). The most common sources of these medications were friends or relatives, followed by physicians and illegal sources (Inciardi et al., 2010).

Side Effects and Toxicity

Sedative-hypnotics have dangerous side effects related to central nervous system depression, especially when taken in high doses or combined with alcohol or opioids. Regular use over a long period of time may result in tolerance. Sedation is the most common effect experienced when taking BZDs. In healthy volunteers, increased sedation can be detected after each dose, even after a week of treatment. Tolerance appears to develop after a few weeks' treatment, but some residual effects may remain, as increased alertness is reported by patients on stopping treatment with BZDs (Lader, 2011).

If long-acting BZDs are prescribed as hypnotic (sleep-inducing) medications (e.g., nitrazepam [marketed under a number of brand names] and flurazepam [Dalmane]), the user experiences definite residual effects the next day (Lader, 2011). Sedative-hypnotics can cause significant dizziness, reduced psychomotor coordination, sedation, and memory impairment (Voyer, Roussel, Berbiche, & Préville, 2010). Use of these drugs contributes significantly to falls and motor vehicle crashes, two common causes of morbidity and mortality (Division of Vital Statistics, 2014). Withdrawal from some of these medications after habitual use can induce seizures and death.

Barbiturates in high doses produce a characteristic syndrome of oversedation, with unsteadiness, poor coordination, slurred speech, and disorientation, and can cause death from respiratory depression. The use of barbiturates and other sedative-hypnotics with drugs that slow down the body, such as alcohol or opioids, multiplies their effects and greatly increases the risk of death. Most overdose deaths in the United States from sedative-hypnotic

Table 2. Commonly Misused Sedative-Hypnotics and Their Applications		
Generic name	**Brand name(s)**	**Used to treat**
Tranquilizers (benzodiazepines and sleeping aids)		
alprazolam	Xanax	Anxiety, insomnia
clorazepate	Tranxene	Anxiety, insomnia
chlordiazepoxide	Librium	Anxiety, alcohol withdrawal, insomnia
clonazepam	Klonopin, Rivotril	Anxiety, insomnia
diazepam	Valium	Anxiety, insomnia
flurazepam	Dalmane	Insomnia
lorazepam	Ativan	Anxiety, insomnia
nitrazepam	various	Insomnia
oxazepam	Serax	Anxiety, insomnia
zolpidem	Ambien	Insomnia
zopiclone	Imovane	Insomnia
Sedatives (barbiturates)		
pentobarbital	Nembutal	Insomnia, presurgical sedation
secobarbital	Seconal	Insomnia, presurgical sedation
Other sedative-hypnotics		
meprobamate	Equanil, Meprospan, Miltown	Anxiety, muscle spasm or rigidity

drugs involve combinations of depressant drugs (SAMHSA, 2014a). Overdose deaths can occur when barbiturates and alcohol are used together, either deliberately or accidentally. BZDs alone are less likely to cause respiratory depression than opioids, but they can be lethal when mixed with alcohol, opioids, or sedatives. Many opioid overdose deaths result from use in combination with BZD tranquilizers.

Paradoxical excitement and disinhibition occurs occasionally and is an unwanted effect that may have legal consequences (Paton, 2002). This effect of BZDs can produce increased anxiety, acute excitement and hyperactivity, and aggressive impulses, including hostility or rage. Estimates of the incidence of this effect range from less than 1% to 20% of those taking BZDs. High-risk patients include those with borderline personality disorders, impulse control disorder, and persistent alcohol problems. The combination of a BZD and alcohol is particularly likely to lead to these hostile reactions. The person may have complete or partial amnesia for the event. Disinhibitory reactions are related to type of BZD, dose, and mode of administration (Bond, 1998).

In addition, nonmedical use of these medications may progress to a drug use disorder. In a cross-sectional analysis of respondents to the 2002–2004 National Survey on Drug Use and Health aged 18 and older, nearly 10% of those who reported past-year nonmedical use of tranquilizers or sedatives (approximately 490,000 people) met criteria for a drug use disorder (Becker et al., 2007).

Use of sedative-hypnotic drugs can adversely affect an unborn fetus. Like opioids and alcohol, these drugs pass

Common Signs of Sedative-Hypnotic Misuse/Overdose

- Unsteadiness
- Poor coordination
- Slurred speech
- Disorientation
- Respiratory depression

through the placenta. A mother's misuse of sedatives during pregnancy can cause preterm birth, low birth weight, or fetal death, and may increase the risk of birth defects and later behavioral problems (Bracken & Holford, 1981; Briggs, Freeman, & Yaffe, 2011; Källén, Borg, & Reis, 2013). Babies born to mothers who misused sedatives during their pregnancy may be physically dependent on the drugs and show withdrawal symptoms after birth. Their symptoms may include breathing problems, feeding difficulties, disturbed sleep, sweating, irritability, and fever.

Who Is Most at Risk for Use Disorder?

Tranquilizer and sedative use is more common among seniors and is more prevalent among women than men (Becker et al., 2007). Other associated risk factors include past criminal arrest, lack of health insurance, unemployment, alcohol use disorder, cigarette use, illicit drug use, younger age of initiating illicit drug use, and a history of intravenous drug use. Those with use disorders are more likely to have agoraphobia (fear of open spaces), be older, be unmarried, have a low education level, and have a history of arrest, compared with users without disorders.

Treatment

For those willing to discontinue use, treatment involves gradually tapering the dose to avoid serious withdrawal effects and treating withdrawal symptoms. If the person is unwilling to discontinue use, the physician may agree to continue treatment, substitute with longer-acting medications, and work toward lowering the dose to the minimum needed to attain a therapeutic effect. Supportive psychotherapy is indicated to treat anxiety, insomnia, and other comorbid disorders (O'Brien, 2005).

Stimulants

Stimulants increase alertness and reduce fatigue. They also can activate the cardiovascular system. Prescription stimulants are primarily used in the treatment of attention deficit hyperactivity disorder (ADHD), narcolepsy (a sleep disorder), binge-eating disorder, and obesity, and "off-label" for depression, stroke rehabilitation, and traumatic brain injury (Westover & Halm, 2012). Stimulants act by blocking reuptake of norepinephrine and dopamine and by increasing their release into the extracellular space (Rothman et al., 2001). The most misused stimulants belong to the stimulant drug classification, which includes Adderall, Ritalin, Vyvanse, and Concerta (see Table 3; Garnier-Dykstra, Caldeira, Vincent, O'Grady, & Arria, 2012). Adderall is reported as the most frequently misused prescription drug among college students (Advokat, Guidry, & Martino, 2008; Johnston, O'Malley, Bachman, & Schulenberg, 2013; Lookatch, Dunne, & Katz, 2012).

Extent and Consequences of Misuse

Nonmedical use of prescription stimulants has become a significant public health concern, especially among young adults and adolescents. Rates of prescription stimulant misuse have soared (Arria & Wish, 2006; Johnston et al., 2013; McCabe, Teter, & Boyd, 2006; SAMHSA, 2009; Teter, McCabe, LaGrange, Cranford, & Boyd, 2006). In 2012, about 1.1 million Americans reported using nonmedical prescription stimulants in the past year (SAMHSA, 2013b). Students give many reasons for using stimulants without a prescription, which include to concentrate, improve alertness, "get high," and experiment (Chen et al., 2014; Wilens et al., 2008).

Table 3. Commonly Misused Stimulants and Their Applications		
Generic name	**Brand name**	**Used to treat**
dextroamphetamine/amphetamine	Adderall	ADHD, narcolepsy
methylphenidate	Ritalin	ADHD, narcolepsy
lisdexamfetamine	Vyvanse	ADHD, binge-eating disorder
methylphenidate	Concerta	ADHD, narcolepsy

The number of people seeking emergency care because of stimulant misuse increased from 9,979 in 2004 to 40,648 in 2011 (SAMHSA, 2013a).

The most common sources of stimulants were friends or relatives, followed by physicians and illegal sources. Sharing was the most common method of diversion, with 33.6% of students sharing their prescription medications and 9.3% having sold them (Garnier et al., 2010).

Side Effects and Toxicity

When stimulants are used as prescribed, side effects may include nervousness, headache, insomnia, anorexia, and tachycardia (rapid heart rate). Symptoms increase with increasing doses. Clinical manifestations of overdose include agitation, hallucinations, psychosis, lethargy, seizures, tachycardia and other heart rhythm abnormalities, high blood pressure, and increased body temperature (Klein-Schwartz, 2002). Chronic use may lead to infection, heart failure, malnutrition, and permanent psychiatric illness (Richards et al., 1999). Stimulant misuse has also been linked to heart and blood vessel problems, drug use disorders, other high-risk behaviors such as unsafe sex, and alcohol-related injuries. More than half of college students who reported misuse of Adderall in the past year were heavy alcohol users (Lakhan & Kirchgessner, 2012).

When taken during pregnancy, stimulants can cause elevated body temperature, seizures, fast or irregular heartbeat, high or irregular blood pressure, sleep problems, tremors, weight loss, and panic attacks in the mother. Stimulants can cause preterm birth or fetal death, increase maternal blood pressure, and increase risks of brain defects, heart defects, and cleft lip/palate in the fetus (Briggs et al., 2011; Bracken & Holford, 1981).

Who Is Most at Risk for Stimulant Use Disorders?

The highest rates of stimulant use are among 12- to 25-year-olds (SAMHSA, 2012). In one literature review, prevalence estimates across studies ranged from 5% to 10% for high school students and 5% to 35% for college students (Clemow & Walker, 2014). A second literature review associated fraternity or sorority membership, poor academic performance, and other substance use with misuse (Benson, Flory, Humphreys, & Lee, 2015). Signs of stimulant misuse (side effects of the drugs) include nervousness or acting "jittery," dry mouth, loss of appetite or weight loss, sleep problems, stomach pains or diarrhea, headaches, dizziness, skin lesions from scratching, and dental problems.

Common Signs of Stimulant Overdose

- Agitation
- Hallucinations
- Psychosis
- Lethargy
- Seizures
- Tachycardia and other heart rhythm abnormalities
- High blood pressure
- Increased body temperature

(Klein-Schwartz, 2002)

Treatment

There are no FDA-approved medications to treat stimulant use disorder. A stepped approach is best, beginning with brief interventions and short-term follow-up. If brief interventions are insufficient, then treatment services with long-term follow-up may be needed. Treatment can include individual or group therapy or intensive outpatient or inpatient treatment. Moderately effective interventions typically use cognitive behavioral skills training and supportive, motivational interviewing approaches (Vocci & Montoya, 2009). Some evidence suggests that contingency management interventions can help to improve retention in treatment and, in turn, other treatment outcomes. Although there are important differences in the neuropsychiatric and medical consequences of cocaine and amphetamine use disorders, similar psychosocial treatment approaches are effective.

Identifying Prescription Drug Abuse

Traditionally, Drug Court staff have relied on biological drug testing to detect drug users. Short questionnaires (20 items or fewer) can also be used for this purpose. Screeners are short questionnaires that identify potential prescription drug use problems. Screening can help prevent misuse of prescription drugs, identify those at risk, and discover a potential addiction problem or point to a need for further evaluation and treatment. Question-based screeners could be useful in helping judicial staff to recognize and deal effectively with prescription drug misuse. Screening for prescription drug misuse is performed for two reasons:

- To identify people at high risk for developing prescription drug use disorders
- To determine whether an individual shows key indicators of a prescription drug use disorder

Screeners are developed to correctly identify people with and without a condition. Screeners with a solid research base are recommended because scientific evidence supports their accuracy (Akobeng, 2007).

General Screening

Screeners for substance misuse may be general—asking about tobacco, alcohol, illegal drug, and prescription drug use—or specific to only one substance or class of drugs. General screeners for substance misuse and use disorder detection typically are used for universal health screening. Most were developed to be administered by medical professionals, but they could be adopted for use by court staff if they are answered honestly.

The *Clinician's Pocket Guide for Drugs, Alcohol, and Tobacco Screening, Brief Intervention, Referral and Treatment*[4] recommends the following screener to detect prescription drug misuse:

1. "Have you ever taken prescription medication that was not prescribed for you or in a way that was not prescribed?" (Any "yes" is a positive screen.)

If "yes," ask:

2. "Tell me more about that…" or "Did you do this only for the feeling/experience that is caused or to 'self-medicate'?"

3. "Have you done this in the past 3 months?"

Opioid Screening

A number of brief screeners are being developed to predict risk of developing prescription drug misuse among patients seeking opioid medications to control pain. The National Institute on Drug Abuse has a screener available on its website (National Institute on Drug Abuse, 2012). For those already being prescribed opioids, risk factors for detecting a current drug use disorder include selling prescription drugs, forging prescriptions, stealing drugs, injecting oral formulations, obtaining prescription drugs from nonmedical sources, concurrently abusing alcohol and illicit substances, escalating doses on multiple occasions despite warnings, claiming to have lost prescriptions on multiple occasions, repeatedly seeking prescriptions from other providers without informing the provider or after warnings to desist, and showing evidence of deteriorating function due to drug use (Manubay, Muchow, & Sullivan, 2011).

4 Available at www.wvmphp.org/247635_WVU_SOM_Pkt_Guide_Single_Pgs-1127.pdf

Stimulant Screening

Currently, no brief specific screeners are geared to detect stimulant misuse, although a 37-item questionnaire has been developed to identify risks for stimulant misuse and use disorder among college students (Bavarian, Flay, Ketcham, & Smit, 2013).

Voyer and colleagues (2010) have developed a two-question screener for older adults to detect benzodiazepine use disorder. If seniors answer yes to both of the following questions, the researchers estimate a 97% possibility that the respondent is BZD dependent:

- "Have you tried to stop taking this medication?"
- "Over the past 12 months, have you noticed any decrease in the effect of this medication?"

Respondents who answer no to either or both questions are 95% likely not to be BZD dependent.

Resources

Drug Misuse in the Workplace

To address prescription drug misuse in the workplace, SAMHSA established the Preventing Prescription Abuse in the Workplace (PAW) program. This program provides technical assistance to workplaces and SAMHSA grantees across America to reduce prescription drug misuse.

PAW has developed more than 30 fact sheets and issue briefs, including the following:

- How to Handle Leftover Meds
- Managing Chronic Low Back Pain While Minimizing Use of Dangerous Prescription Opioids
- Pregnancy and Prescription Drug Abuse
- Prescription Drug Misuse among College Students
- Prescription Drug Misuse among Older Adults: Understanding the Problem
- Screening for Prescription Drug Use Problems

These fact sheets are available at publichealth.hsc.wvu.edu/icrc/prevention-of-prescription-drug-abuse-in-the-workplace/samhsa-fact-sheets

Opioid Toolkit

SAMHSA has also produced an Opioid Toolkit, which equips communities and local governments with material to develop policies and practices to help prevent opioid-related overdoses and deaths, and addresses issues for first responders, treatment providers, and those recovering from opioid overdose. It is available at store.samhsa.gov/product/Opioid-Overdose-Prevention-Toolkit-Updated-2014/SMA14-4742

Additional Resources

Screening resources

The NIDA Quick Screen: www.drugabuse.gov/publications/resource-guide-screening-drug-use-in-general-medical-settings/nida-quick-screen

SAMHSA's Screening, Brief Intervention, and Referral to Treatment: www.integration.samhsa.gov/clinical-practice/SBIRT

List of commonly misused drugs

www.drugabuse.gov/drugs-abuse/commonly-abused-drugs-charts

FAQ on sedative-hypnotics

www.well.com/user/woa/fsseda.htm

Information on medication-assisted treatment

www.samhsa.gov/medication-assisted-treatment

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