



14

PRACTICAL THEORIST

Methamphetamine

Everything, Everywhere, and its Prevention

Supported in Part by the
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Methamphetamine is a potent and highly addictive stimulant that affects the central nervous system (i.e., a psychostimulant). It does not occur naturally and is a controlled Schedule II substance under the federal Controlled Substances Act due to its high potential for abuse and potential to lead to psychological/physical dependence. Methamphetamine is a powerful stimulant that can have long-lasting impacts on those who misuse it. It is also highly toxic and can induce psychiatric, cardiopulmonary, neurological, and other problems requiring immediate medical attention.

This drug is readily available and relatively cheap throughout the United States (National Institute on Drug Abuse [NIDA], 2021a; U.S. Drug Enforcement Administration [DEA], 2021). In 2021, 2.5 million people aged 12 or older used methamphetamine in the past year, according to the National Survey on Drug Use and Health (NSDUH) (Substance Abuse and Mental Health Services Administration [SAMHSA], 2022).

According to the 2021 National Survey on Drug Use and Health, 2.54 million people have said they've used methamphetamines in the 12 months prior. More than half of these respondents report having methamphetamine use disorder (NSDUH, 2021).

Methamphetamine use disorder is defined by the physicians' Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) as *a pattern of amphetamine-type substance use leading to clinically significant impairment and distress when at least two of 11 diagnostic criteria within a 12-month period are met*. There is still no pharmacotherapy available for addiction to methamphetamine (Wainwright, J. J., Mikre, M., Whitley, P., Dawson, E., Huskey, A., Lukowiak, A., & Giroir, B. P., 2020).

Methamphetamine Use- 2021 (The National Survey on Drug Use and Health)		
	Methamphetamine Use in the Past Year (2021)	Methamphetamine Use in Lifetime (2021)
Total	2,549,000	16,830,000
Gender		
Male	1,617,000	9,543,000
Female	932,000	7,287,000
Race		
White	1,869,000	13,183,000
Black or African American	152,000	511,000
American Indian/ Alaskan Native	34,000	201,000
Two or More Races	88,000	566,000

This Practical Theorist is part of a series of publications designed to summarize field research on key drug use issues and to present it in a concise, practical format, with strategies for using the data to mobilize communities and support your coalition's mission.

What is Methamphetamine?

Chemistry and History

Methamphetamine is a man-made drug. Chemically, the structure of methamphetamine is similar to amphetamine and to dopamine—a brain chemical (or neurotransmitter) that plays an important role in getting us to repeat pleasurable activities (reinforcement) (NIDA, 2021c). Methamphetamine has very limited medical use for the treatment of attention deficit/ hyperactivity disorder (ADHD) or weight loss and is only available through a non-refillable prescription (DEA, 2020; NIDA, 2021a).

Methamphetamine is created from amphetamines which were first synthesized by a chemist from Romania in 1887: Lazar Edeleanu. Six years later, methamphetamines were derived in 1893 by Nagai Nagayoshi, a Japanese

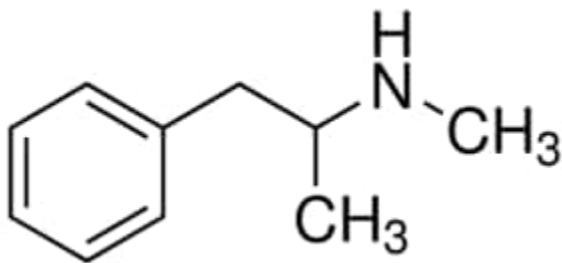
pharmacologist studying in Germany. Methamphetamine was dispensed as early as 1938 and throughout World War II to help soldiers and night shift workers stay awake. Doctors stopped prescribing it just a couple years later after it was discovered that soldiers using it were unstable while under its effects and hung over for days after the effects wore off. Various countries began to prohibit over-the-counter access to methamphetamine in response to rising rates of addiction (Defalque, R. J., & Wright, A. J., 2011). It became a Schedule II-controlled substance under the United Nations Convention on Psychotropic Substances treaty in 1971 ([The United Nations, 1971](#)).

Important Dates in the History of Methamphetamine

Year (s)	Event
1887	Lazar Edeleanu, Romanian chemist, synthesizes amphetamines.
1893	Nagai Nagayoshi, a Japanese pharmacologist, derives methamphetamines with the Edeleanu process.
1919	The creation of methamphetamine was refined by Akira Ogata. He used ephedrine with red phosphorus and iodine- a variation of many current recipes.
1938	Methamphetamine used a prescription medication
1940-1945	Methamphetamine was used by troops in World War II as a way to stay awake and to increase energy. Pilots were also given methamphetamines during their longer flights. The residual aftereffects lead to a more stringent dosage schedule.
1950's & 1060's	Methamphetamine prescribed as <i>Obetrol</i> to help people struggling with obesity. Its addictive properties became apparent and strict regulations were put in place.
1970	The <i>Controlled Substances Act</i> was passed, making it illegal to produce or consume methamphetamine without a prescription.
1988	The <i>Chemical Diversion and Trafficking Act</i> regulated pseudoephedrine and ephedrine in bulk powder forms.
1995	The <i>Domestic Chemical Diversion Control Act</i> ensured Ephedrine single-ingredient products were regulated.
1996	The <i>Comprehensive Methamphetamine Control Act</i> regulated all products that contained pseudoephedrine even if the products had other active medicinal substances.
2000	The <i>Methamphetamine Anti-Proliferation Act</i> required a reduction in the amount of pseudoephedrine that could be purchased over the counter. It also regulated the sale and distribution of chemicals needed to make methamphetamine.
2005	Congress passed the <i>Combat Methamphetamine Act</i> - Pharmacies were required, with this legislation, to keep logs of purchased produced containing pseudoephedrine.

How Is Methamphetamine Manufactured?

Most methamphetamine in the United States is currently produced by transnational criminal organizations (TCOs) in Mexico. This methamphetamine is highly pure, potent, and low in price. It is manufactured using multiple methods, which use a variety of different chemicals depending on the process. The drug can be easily made in small clandestine laboratories, with relatively inexpensive over-the-counter ingredients such as pseudoephedrine, a common ingredient in cold medications. To curb this kind of production, U.S. law requires pharmacies and other retail stores to keep a purchase record of products containing pseudoephedrine and take steps to limit sales (DEA, 2021). Mexico has also tightened its restrictions on pseudoephedrine and other methamphetamine precursor chemicals. But TCOs circumvent these restrictions in various ways, including using uncontrolled precursor chemicals or different processes for production (DEA, 2021).



The Early Chemical Make-Up of Methamphetamine

In the United States, labs have been found in all parts of the country. However, restrictions on the chemicals used to make methamphetamine in the United States and the potency and low prices of the product from Mexican competitors have dramatically reduced domestic manufacturing of the drug. In 2019, authorities reported 890 seizure incidents of methamphetamine laboratories—the lowest reported in 19 years and down from a peak of 23,703 in 2004 (DEA, 2021). However, methamphetamine remains the most frequently manufactured drug seized in clandestine laboratories in the United States (DEA, 2021). These small-capacity methamphetamine production laboratories (2 ounces or less) are easy to conceal and use common household items to make the drug. These can be set up anywhere, and are often dangerous—frequently causing fires, serious injuries, or even death (DEA, 2021).

Other domestic labs are sites for extracting methamphetamine dissolved in a liquid (e.g., vehicle fluids, fuels, water, and alcoholic beverages) produced elsewhere into a form for selling on the streets. Domestic labs also convert methamphetamine in powder or liquid form into crystal methamphetamine. These laboratories do not

require a significant amount of equipment, so they can be small and easily concealed, which presents challenges to law enforcement agencies (DEA, 2021).

Methamphetamine residues can persist in the labs for months, resulting in exposure and clothing contamination of occupants and those who enter the premises (Wright, J, Edwards, J, & Walker, S, 2016). School aged children removed from homes where methamphetamine is produced show more school maladjustment and poorer attitudes toward teachers than their peers, while preschoolers show more aggression, though these findings are confounded by children having been removed from the home (Asanbe, CB, Hall, C, & Bolden, CD, 2008).

The most conventional methods of methamphetamine production are the *Birch Reduction Method* and the *Red Phosphorus Method*. The principal chemicals involved in both methods include ephedrine or pseudoephedrine, both of which are available in over-the-counter cold medicines, along with a combination of other chemicals (Owens, CV, Mason, MM & Marr, D, 2017).

The *Red Phosphorus* methods is most commonly associated with the *cold cooking* or *shake-and-bake* process. This process is very portable and very dangerous. With ephedrine, ingredients commonly include, but may not be limited to:

- Amphetamines
- Red Dye
- Sulfur
- Copper salts
- Iodine
- Phosphorus
- Fentanyl or other synthetic opioids



Methamphetamine from the Red Phosphorous Method



Several indicators show that methamphetamine misuse has increased in recent years. NSDUH data from 2015 to 2019 show that past-year methamphetamine misuse among people aged 18 or older increased 43 percent (Han et al., 2021a). During this period, methamphetamine misuse—both with and without misuse of opioids or cocaine—increased. Frequent methamphetamine misuse (defined as misuse on 100 days or more during the past year) increased 66 percent (Han et al., 2021a).

Historically, methamphetamine misuse was more common among White people in rural regions, but NSDUH data indicate that this has changed. Misuse has been increasing among individuals who are White, Black, Asian or Other Pacific Islanders, and Hispanic—particularly among those with socioeconomic risk factors (e.g., unstable housing and lower income) and more comorbidities (e.g., depression and polysubstance use) (Han et al., 2021a). Overall, methamphetamine use disorder (MUD) without injection doubled from 2015 to 2019 (Han et al., 2021a). During this period, MUD without injection (Han et al., 2021a):

- More than tripled among women and more than doubled among men;
- Increased more than tenfold among African Americans;
- Nearly tripled among White individuals; and
- More than doubled among Hispanic individuals.

Another sign of the problem is that the proportion of substance use treatment admissions for which methamphetamine was the primary drug problem increased from 15.1 percent in 2008 to 23.6 percent in 2017 (Jones, Olsen, O'Donnell & Mustaquim, 2020).

Research also suggests that injection of methamphetamine has increased. One study found that the percentage of methamphetamine injection increased from 17.5 percent of substance use treatment admissions in 2008 to 28.4 percent in 2017 (Jones, Olsen, O'Donnell & Mustaquim, 2020). A study of individuals discharged from substance use disorder treatment found that the increase in methamphetamine injection was most pronounced among Black people who live in urban areas (Pro, Hayes, Montgomery, & Zaller, 2022). However, an analysis of NSDUH data from 2015 and 2019 found that the risk of methamphetamine injection was higher among other race/ethnicity subgroups compared with Black individuals. This study also found that people in small cities and rural areas

were at greater risk for methamphetamine misuse than those in large urban centers (Han et al., 2021a).

How People Misuse Methamphetamine

The various forms of methamphetamine can be smoked, snorted, injected, or swallowed. The preferred method of using the drug varies by geographical region and has changed over time (Chomchai & Chomchai, 2015). Smoking or injecting methamphetamine puts the drug very quickly into the bloodstream and brain, causing an immediate, intense “rush” and amplifying the drug’s addiction potential and adverse health consequences. The rush, or “flash,” lasts only a few minutes and is described as extremely pleasurable. Snorting or oral ingestion produces euphoria—a high, but not an intense rush. Snorting produces effects within 3 to 5 minutes, and oral ingestion produces effects within 15 to 20 minutes (Chomchai & Chomchai, 2015; Panenka et al., 2013; Courtney & Ray, 2014).

As with many stimulants, methamphetamine is most often misused in a “binge and crash” pattern. Because the pleasurable effects of methamphetamine disappear even before the drug concentration in the blood falls significantly, users try to maintain the high by taking more of the drug. In some cases, people indulge in a form of binging known as a “run,” foregoing food and sleep while continuing to take the drug for up to several days (Chomchai & Chomchai, 2015; Panenka et al., 2013; Courtney & Ray, 2014).

Co-occurring substance use is common among people who use methamphetamines. According to data from the 2015-2018 National Surveys on Drug Use and Health, among adults who used methamphetamine in the past year, 68.7% reported past-year use of cannabis, 40.4% reported past year use of opioids, 30.4% reported past year use of cocaine, and 44.3% reported past-month nicotine dependence (Jones, C. M., Houry, D., Han, B., Baldwin, G., Vivolo-Kantor, A., & Compton, W. M., 2022).

Co-misuse of stimulants and opioids (sometimes called “speedballing”) is not a new phenomenon, as people have mixed heroin and cocaine for years (NIDA, 2021b). A more specific and recent pattern is mixing opioids and methamphetamine (“goofballing”). A key indicator of this co-use is the rising proportion of opioid overdose deaths that also involve methamphetamine (Centers for Disease Control and Prevention [CDC], 2022; Jones et al., 2022) and an increase in methamphetamine use among people in treatment whose primary drug was heroin (Jones, Underwood & Compton, 2020). The upward trend in

mixing methamphetamine and opioids was also reflected in an analysis of postings to a popular online forum (Sarker et al., 2022). In interviews, people who co-use methamphetamine and opioids describe various reasons—including enhancing the effect of one or both drugs, feeling the balanced combination of both drugs, or lessening side effects (Rhed et al., 2022). However, *overdose risk is not reduced by taking a stimulant and opioid together*. In fact, there is increased risk for non-fatal overdose (Korthuis et al., 2022), and fentanyl contamination of methamphetamine increases the risk of overdose death (CDC, 2022c). Further, co-misuse of methamphetamine is linked with worse treatment outcomes among those in treatment for opioid use disorder (Tsui et al, 2020; Ware, Manuel & Huhn, 2021).



A house in Billings, MT. This is a house where methamphetamine use takes place: the placard has a list of terms used by people addicted to methamphetamine alongside an appeal for prevention. Examples include: a term for when the house is open, a term for when teeth start rotting, and others.

What Are the Effects of Methamphetamine?

Methamphetamine is a stimulant that targets the central nervous system, and the route of administration. The form of the substance determines the speed at which a person can experience the effects. It can take anywhere from 15 seconds to 30 minutes for the user to feel its effects. For example, someone using methamphetamine orally, by pill or drinking it, won't experience the peak effects until 90 minutes after ingestion. Smoking crystalline enables the user to feel the effects in as few as 7 seconds. Peak effects following smoking, snorting, or injecting methamphetamine occur within 15 minutes (Hart, C. L., Gunderson, E. W., Perez, A., Kirkpatrick, M. G., Thurmond, A., Comer, S. D., & Foltin, R. W., 2008).

Methamphetamine's Actions in the Brain

Methamphetamine increases the amount of the natural chemical dopamine at synapses in the brain. Dopamine is involved in body movement, motivation, and reinforcement of rewarding behaviors. Methamphetamine rapidly releases high levels of dopamine in reward areas of the brain, which makes those who misuse it want to repeat the experience. Taking even small amounts of methamphetamine can result in many of the same health effects as other stimulants, such as cocaine (NIDA, 2019).

Differences Between Methamphetamine and Cocaine

Methamphetamine and cocaine have some similar behavioral and physiological effects. However, there are some major differences in the basic mechanisms of how they work (Chiu & Schenk, 2012). Although both drugs increase levels of dopamine in the brain, studies in animals have shown that methamphetamine leads to much higher levels of this neurotransmitter than cocaine, because nerve cells (or neurons) respond differently to the two drugs. Cocaine prolongs dopamine actions in the brain by blocking the re-absorption (re-uptake) and reversing transport of the neurotransmitter by signaling nerve cells. At low doses, methamphetamine also blocks the re-uptake of dopamine. It also increases the release of dopamine, leading to much higher concentrations in the gap between neurons—which can be toxic to nerve terminals (Panenka et al., 2013; Moszczynska, 2016). Cocaine is quickly removed from and almost completely metabolized in the body. In contrast, a larger percentage of methamphetamine remains unchanged in the body so that it has a much longer duration of action. Because methamphetamine remains in the brain longer, it has prolonged stimulant effects (Chiu & Schenk, 2012).

Short-Term Effects of Methamphetamine Misuse

As a powerful stimulant, even in small doses methamphetamine produces euphoria and increases wakefulness, attention, physical activity, and body temperature. The drug also decreases appetite and fatigue. When someone is high on methamphetamine, they may not make good decisions and may engage in risky behaviors. One such behavior is driving under the influence of the drug—a behavior reported by almost half of adults who misused methamphetamine in the past year (Goings et al., 2022). Methamphetamine can also cause a variety of cardiovascular problems, such as rapid heart rate, irregular heartbeat, and increased blood pressure. As noted, methamphetamine overdose is possible and can result in death if not treated immediately (Chomchai & Chomchai, 2015; Panenka et al., 2013).



A glass meth pipe

Long-Term Health Effects of Methamphetamine Misuse (Comorbidities)

Long-term methamphetamine misuse has many negative consequences, including addiction—a chronic, relapsing condition, characterized by compulsive drug seeking and use, and accompanied by functional and molecular changes in the brain. As is the case with many drugs, repeated misuse over the long term leads to a reduction in methamphetamine's pleasurable effects so that higher doses, more frequent consumption, or a change in how it is taken are needed in order to get the desired effect. Repeated methamphetamine misuse may diminish feelings of pleasure from other sources. When someone who frequently misuses methamphetamine stops taking the drug, they may experience depression, anxiety, fatigue, and an intense craving for it (Courtney & Ray, 2014).

In addition to addiction, people who misuse methamphetamine long term may experience significant anxiety, confusion, memory loss, insomnia, and mood disturbances (NIDA, 2019). They may display violent behavior or some symptoms of psychosis, such as paranoia and visual and auditory hallucinations (Rusyniak, 2013). Even after stopping methamphetamine misuse, they may experience psychotic symptoms (such as auditory

and tactile hallucinations) (Akindipe, Wilson & Stein, 2014; Glasner-Edwards & Mooney, 2014), especially when under stress (Glasner-Edwards & Mooney, 2014). Such problems reflect significant structural and functional changes in the brain caused by methamphetamine misuse, as shown by multiple neuroimaging studies with people (London, Kohno, Morales & Ballard, 2015) and by animal research (Groman, Morales, Lee, London & Jentsch, 2013).

Methamphetamine has negative effects on brain cells over the long-term. The drug damages both neurons and cells that support brain health (microglia). Microglia defend the brain against infectious agents and remove damaged neurons. But when these support cells are overactivated, they can assault healthy neurons. A study using brain imaging found more than double the levels of microglial cells in people who previously misused methamphetamine compared to people with no history of methamphetamine misuse (Sekine et al., 2008). This may explain some of the damaging effects of methamphetamine on the brain. Importantly, some of these brain changes may reverse after being off the drug for a year or more (Sekine et al., 2008; Salo et al., 2011), but other changes may not recover even after a long period of time (Wang et al., 2017). Because methamphetamine increases the risk of stroke, people who misuse it may suffer neurological damage as a result (NIDA, 2021). Research has also linked methamphetamine misuse with increased risk for Parkinson's disease, a nervous system disorder involving the dopamine system that affects movement (Kuehn, 2011).

The long-term physical effects of methamphetamine misuse include extreme weight loss, severe tooth decay and tooth loss, and skin damage. The dental problems (e.g., increased cavities and missing teeth) may be caused by a combination of poor nutrition and dental hygiene as well as dry mouth and teeth grinding caused by the drug (Shetty et al., 2015). Methamphetamine misuse reduces skin elasticity, which may cause premature aging (Hennings & Miller, 2013), and can result in skin sores from picking and scratching to get rid of insects imagined to be crawling under it (Panenka et al., 2013).

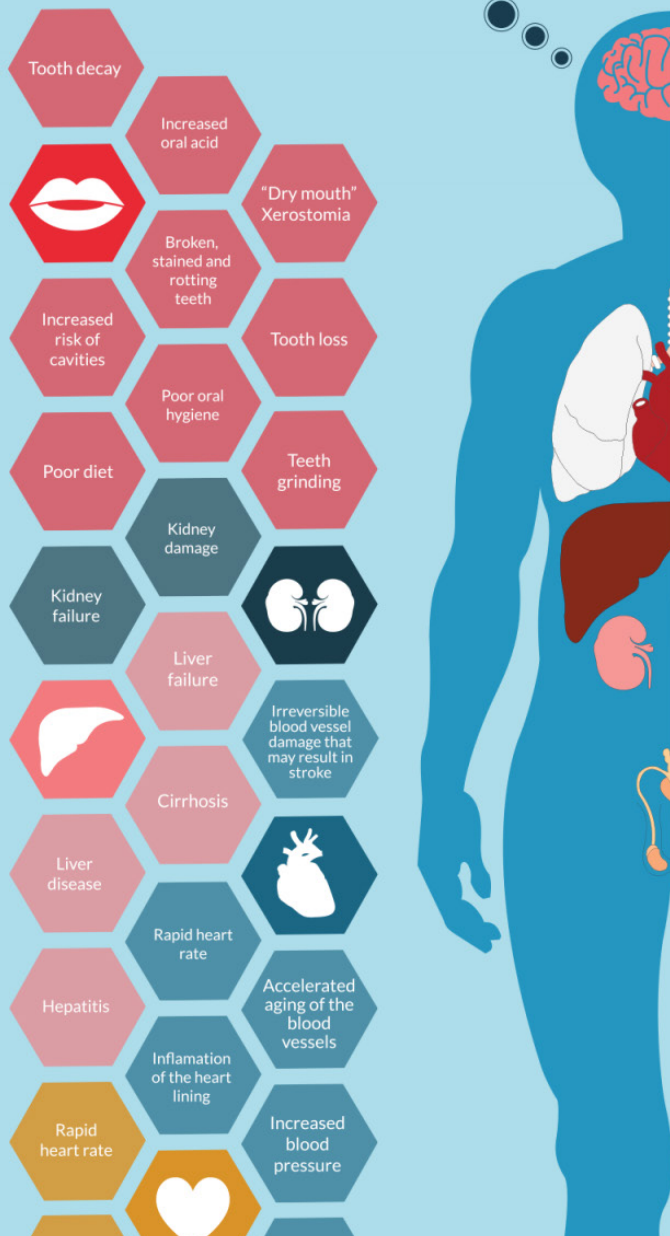
Methamphetamine Misuse and Risk for HIV and Hepatitis B and C

Methamphetamine misuse—whether the drug is taken by injection or not—increases the risk of the infectious diseases of HIV and Hepatitis B and C. In cases of methamphetamine injection, these diseases may be transmitted through contact with blood or other bodily fluids that can remain on drug equipment (e.g., syringes and needles) that is reused or shared (NIDA, 2021).

LONG TERM EFFECTS OF METH ON THE BODY



IRRITABILITY
ADDICTION **IMPAIRED JUDGMENT**
VIOLENT BEHAVIOR **MEMORY LOSS**
BRAIN HEMORRAGE (STROKE) **ANXIETY**
HOMICIDAL OR SUICIDAL THOUGHTS
AGGRESSION **PERMANENT DAMAGE** **PARANOIA**
INSOMNIA **IMPAIRED COGNITION** **CONFUSION**
LOSS OF COORDINATION **MOOD DISTURBANCES**
HALLUCINATIONS



Individuals who misuse methamphetamine in ways other than injection (i.e., swallowing, snorting, and smoking) are also at increased risk for HIV and hepatitis B and C via sexual transmission. . Methamphetamine misuse is associated with a culture of risky sexual behaviors (e.g., unprotected sex), both among men who have sex with men (Shoptaw, 2006; Hoenig, 2017) and in heterosexual populations (Zule, Costenbader, Meyer, Jr., & Wechsberg, 2007), a link that may relate to stimulants' enhancement of libido in the short term (Shoptaw, 2006). However, long-term methamphetamine misuse may be linked with diminished sexual functioning among men (NIDA, 2021). Another study found that women who used methamphetamines were four time more likely to be exposed to hepatitis B virus than men (Tressler, SR, Kushner, T, & Bhandari, R, 2020).

Methamphetamine misuse may worsen the progression of HIV/AIDS and its consequences. Clinical studies of patients taking highly active antiretroviral therapy (HAART) to treat HIV suggest that those who currently misuse methamphetamine may be at greater risk of developing AIDS than those who do not take the drug. This may be the case because people who misuse methamphetamine are less likely to take HAART as indicated (Ellis et al., 2003; Fairbairn et al., 2011). HIV is associated with nerve cell injury and cognitive problems, and people with HIV who misuse methamphetamine show worse outcomes than those who do not misuse the drug (Chang, Ernst, Speck & Grob, 2005; Blackstone et al., 2013). However, individuals who receive treatment for methamphetamine misuse and HIV-prevention interventions can reduce sexual and injection-related risky behaviors, decreasing the risk of exposure to HIV and transmission of other infections (Rawson et al., 2008; NIDA, 2021).

Methamphetamine Overdose Deaths

How Big Is the Problem?

Provisional data show that methamphetamine was involved in more than 30,000 overdose deaths in 2021—an increase of 33 percent from the previous year (CDC, 2022). The upward trend in methamphetamine overdose deaths has been evident for some time. From 2012 through 2018, the age-adjusted rate of drug overdose deaths involving psychostimulants (largely methamphetamine) increased nearly fivefold (Hedegaard, Miniño & Warner, 2020). A major

Image taken from Addictionblog.org



concern is that this dangerous drug is also increasingly contaminated with illicitly manufactured fentanyl—a man-made opioid that is up to 50 times stronger than heroin and 100 times more potent than morphine—which further increases the risk of overdose death (NIDA, 2021; DEA, 2021; CDC, 2022b). In 2020, more than sixty percent of overdose deaths involving the methamphetamine drug category involved opioids (NIDA, 2022). But it is important to realize that psychostimulant-involved deaths have increased with and without opioid co-involvement (Kariisa et al., 2021; NIDA, 2022).

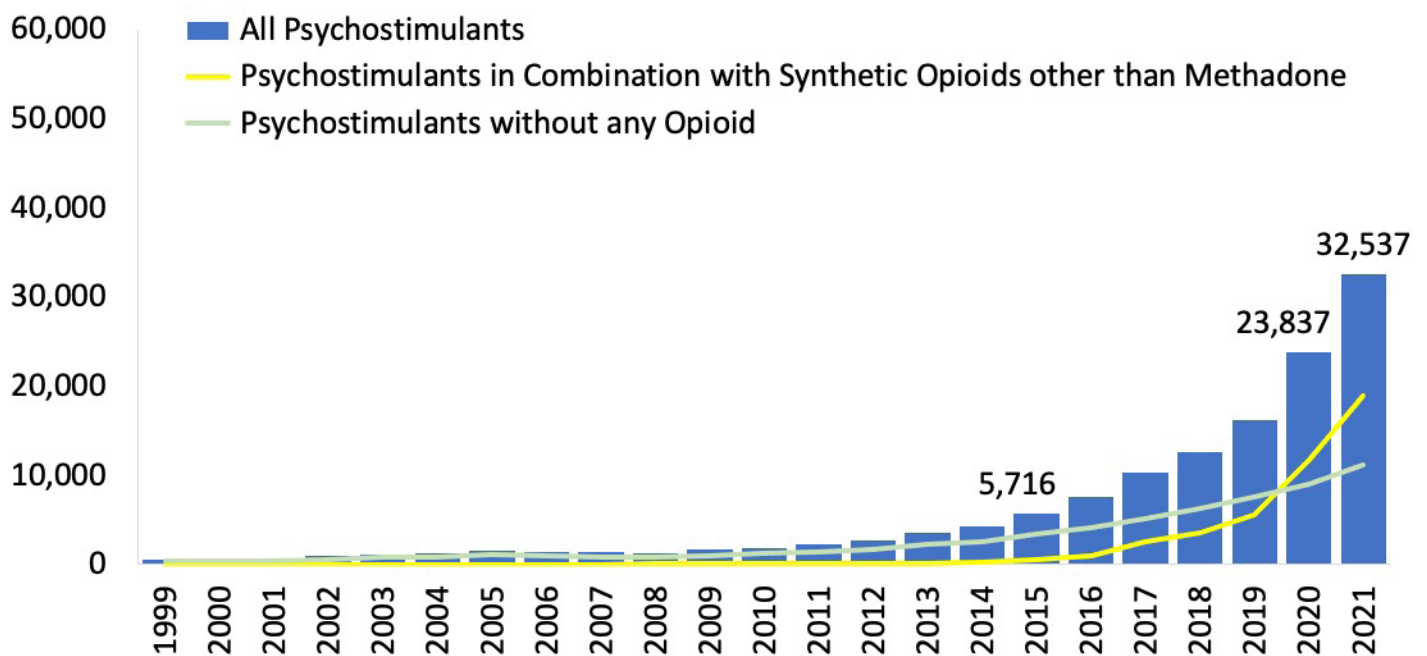
Methamphetamine-related overdose deaths disproportionately affect men overall—with average increases of about 29 percent each year between 2011 and 2018 in this population. However, Black men showed the

greatest average annual increase (about 41 percent) among all subgroups (Han et al., 2021a). During 2011–2018, deaths involving methamphetamine were highest among American Indian or Alaska Native (AI/AN) individuals, and notably, women in this group had higher methamphetamine-related death rates than Black, Asian, and Hispanic men (Han et al., 2021b). Another data analysis covering 2004–2019 indicates that cocaine-related overdose death rates were highest for Black people, whereas AI/AN individuals had the highest rates of methamphetamine-involved overdose deaths (Kariisa et al., 2021).

Risk Factors for Methamphetamine Misuse

The risk and protective factors that children and adolescents experience affect the likelihood of substance misuse in general and probably apply to methamphetamine. Those risk factors include:

National Overdose Deaths Involved Psychostimulants with Abuse Potential (Primarily Methamphetamine)* by Opioid Involvement, Number Among All Ages, 1999-2021



*Among deaths with drug overdose as the underlying cause, the psychostimulants with abuse potential (primarily methamphetamine) category was determined by the T43.6 ICD-10 multiple cause-of-death code. Abbreviated to *psychostimulants* in the bar chart above. Source: Centers for Disease Control and Prevention, National Center for Health Statistics. Multiple Cause of Death 1999-2021 on CDC WONDER Online Database, released 1/2023.

Image taken from the National Institute on Drug Abuse (<https://nida.nih.gov/research-topics/trends-statistics/overdose-death-rates>)

- Poverty,
- Drug Availability,
- Substance use among peers,
- Lack of parental supervision, and
- Early aggressive behavior

The more risk factors individuals have, the greater their risk for substance misuse. Protective factors include being strongly attached to one’s neighborhood, anti-substance use policies, academic competence, parental monitoring, and self-control (NIDA, 2020).

Most people who misuse methamphetamine have previously used other substances (Jones et al., 2022). Risk factors for methamphetamine misuse, MUD, injection, and frequent misuse include several social determinants of health—such as lower educational attainment, lower annual household income, lack of health insurance, housing instability, and criminal justice involvement—according to an analysis of NSDUH data. The risk for these methamphetamine-related problems was also higher among individuals with comorbidities (e.g., HIV/AIDS and hepatitis B or C virus) and psychiatric disorders (e.g., depression), suicidal ideation, and polysubstance use (Han et al., 2021a). An analysis of substance misuse treatment admission data confirmed the importance of social determinants of health and a lack of resources (e.g., unemployment or not being in the labor force and homelessness) in the risk for methamphetamine misuse (Jones, Olsen, O’Donnell & Mustaquim, 2020).

Preventing Misuse and Reducing Overdose Deaths Through Evidence-Based Interventions

Community-level programs can reduce methamphetamine misuse by following research-guided general principles and implementing evidence-based interventions, including universal prevention (Spoth, Clair, Shin & Redmond, 2006). Evidence-based treatment of methamphetamine misuse and MUD is an important way to prevent overdose and negative health effects. People can and do recover from MUD if they have ready access to effective treatments that address the multitude of medical and personal problems resulting from their long-term use of the drug.

Currently, the most effective treatments for MUD are behavioral therapies, particularly contingency management (CM), which provide concrete rewards—even small incentives, such as gift cards—in exchange

Although medications have proven effective in treating some substance use disorders, there are currently none approved that specifically counter methamphetamine misuse or reduce the use of the drug by an individual with MUD.

for engaging in treatment and maintaining abstinence. In addition to treating MUD, CM has been shown to be highly effective for a wide range of substance misuse disorders and related problems (Petry et al., 2005; Peirce et al., 2006; Roll et al., 2006; Petry, 2011). Combining CM with other approaches (e.g., cognitive-behavioral therapy) can also reduce methamphetamine misuse (Shoptaw et al., 2005). Research also indicates that the Matrix Model—a comprehensive treatment approach that combines behavioral therapy, family education, individual counseling, 12-step support, drug testing, and encouragement for non-drug-related activities—is effective at helping people reduce methamphetamine misuse.

Although medications have proven effective in treating some substance use disorders, there are currently none approved that specifically counter methamphetamine for treating methamphetamine use disorder. However, combining two medications that are effective for reducing other substance use—injectable naltrexone (opioids and alcohol) and oral bupropion (nicotine)—has shown some promise at improving the treatment outcomes of individuals with moderate to severe MUD (Trivedi et al., 2021). Research continues toward the development of new treatments for methamphetamine misuse—including medication, antibody treatments, sequestrants, brain stimulation approaches, and behavioral therapies.

Community Prevention

In 2005, CADCA created the Seven Strategies for Community Change through a partnership with the University of Kansas. These strategies comprise both individual (i.e., person focused) and environmental strategies (i.e., which work more broadly with the context of the community). Research shows that coalitions working across all seven strategies can reduce substance misuse. Examples of objectives under each strategy are shown in the table on the next page.

Strategy Category	Intervention Description
Provide Information	<p>Increase awareness of the dangers of methamphetamine and its presence/availability within the community:</p> <ul style="list-style-type: none"> • Ensure awareness of support systems and community agencies to reduce feelings of isolation. • Provide information about the forms of methamphetamine and the dangers of misuse. • Develop and disseminate communication messages/media campaigns to raise awareness.
Building Knowledge/Skills	<p>Increase the capacity of key sectors who work with vulnerable populations to address risk and protective factors for methamphetamine misuse and polysubstance use:</p> <ul style="list-style-type: none"> • Improve community understanding of methamphetamine misuse among harm reduction partners and treatment programs. • Enhance understanding of methamphetamine manufacturing and overdose among other sectors (e.g., law enforcement and first responders) by building relationships. • Increase understanding of individual risk factors for methamphetamine misuse and community-level susceptibility (e.g., creation of labs and signs of production).
Providing Support	<p>Ensure supports are in place to:</p> <ul style="list-style-type: none"> • Attend to risk factors during times of crisis (e.g., COVID-19 pandemic). • Provide community support for individuals experiencing isolation and anxiety.
Enhancing Access and Reducing Barriers	<ul style="list-style-type: none"> • Work with vendors of chemicals to ensure they understand the chemicals involved in methamphetamine manufacture. They can then work with community leaders and sectors to methamphetamine activity in the area. • Engage with partners to increase the availability of tests for synthetic opioids in methamphetamine (e.g., fentanyl test strips).
Changing Consequences/Incentives	<ul style="list-style-type: none"> • Support initiatives and incentives that ensure quick identification of methamphetamine in the community.
Changing the Physical Design of the Environment	<ul style="list-style-type: none"> • Identifying and remediating homes and buildings where methamphetamine misuse has taken place.
Policy	<ul style="list-style-type: none"> • Require data sharing about methamphetamine overdose between first responders (i.e., emergency medical technicians) and other healthcare providers. • Support standardized use of Screening, Brief Intervention, and Referral to Treatment (SBIRT) in school systems and youth organizations to identify young people at risk for methamphetamine misuse and prevent chronic misuse.

Key Sectors for Partnership in Preventing Methamphetamine Misuse

The Drug Free Communities program was created to galvanize and support community-wide efforts to prevent substance misuse. DFC coalitions prevent substance misuse by implementing evidence-based strategies and activities at the community level. The language of the legislation that established the DFC program named several sectors for coalition partnerships. Coalitions are uniquely positioned to serve as conveners for sectors that may not ordinarily interact. The community-level harm of methamphetamine misuse requires a coordinated effort across multiple sectors, including:

- 1) Education**—The education infrastructure includes primary, secondary, and higher education. It is especially important to support youths whose families are struggling and those who have started misusing substances. School-based drug education and prevention programs should include information on the risks and health consequences of methamphetamine misuse.
- 2) Public Health**—Partnerships between public health agencies at the local and state levels can facilitate coalition notification about infectious disease outbreaks associated with methamphetamine misuse. Coalitions can then warn their service populations about additional dangers of injection use and other risky behaviors. Public health partners can provide access to local data, health promotion and education strategies, and communication materials and contribute to prevention and harm reduction efforts.
- 3) Healthcare**—As frontline workers, providers may be the first to identify that people in the community have oral health problems or infectious disease symptoms. Partnerships with healthcare providers can help coalitions assess the severity of methamphetamine misuse in their service area. Implementation of SBIRT in healthcare settings can facilitate the recognition of methamphetamine misuse and referral of patients to behavioral health support to limit the community impact. Providers can be key partners in prevention by sharing information on the dangers of initiating methamphetamine misuse.
- 4) Faith-Based Organizations**—Sharing information, building the community, and advocacy are essential components of prevention. Faith-based groups can be a key partner in providing support directly to the communities they



serve and integrating prevention and community wellness into their programs. Because coalitions play the role of convener, there is no limit to the types of faiths that can be brought into prevention work.

- 5) Law Enforcement**—As first responders and community safety professionals, law enforcement officials have firsthand knowledge of the effects of methamphetamine on the community. Some law enforcement agencies track this information and may be willing to share it with community coalitions to support prevention. Above all, coalitions should understand the importance of law enforcement in advancing prevention, as they are aware that we cannot arrest our way out of this problem.
- 6) Emergency Medical Services (EMS) Professionals**—As first responders, these professionals can also identify the presence of methamphetamine and where it is manufactured in the community. Partnerships involving sharing this information with coalition partners can help direct prevention efforts. EMS professionals who have witnessed the negative health effects of methamphetamine misuse and overdose may be willing to share what they have seen and serve as excellent speakers at awareness and prevention events.
- 7) Business Groups**—Business partners are often one of the more robust sectors involved in coalition prevention work, as their interests thrive in a safe and healthy community. Coalitions can make the case that community-level prevention efforts save money in the long-term and benefit the business climate by enhancing the general environment and boosting the pool of customers and potential workers. Some businesses—for example, ones that supply chemicals—can share information on excess purchases and establish limits to impede clandestine lab development. Others, such as long-haul trucking firms, will have an interest in ensuring that their workers do not misuse methamphetamine to fight fatigue. As methamphetamine can be used as a “party drug,” nightclub owners may desire to keep the drug out of their establishments. All these business partners



could be brought into coalitions' prevention work focused on methamphetamine.

- 8) **Youth Groups**—Youths are often the focus of coalition prevention efforts. Many young people want to make a difference and just need some guidance to learn how to change their own and others' lives for the better. Young people can spread the word on the signs of misuse in their schools and community groups. They can also be trained to identify peers with families who are struggling and guide them to the appropriate support. Coalitions should include non-school youth groups in meetings and listen to their voices. Youths who have experienced the effects of substance misuse firsthand—such as lost loved ones or attend school with peers who have been involved with drugs—are often the best candidates for taking an active role in prevention efforts. They are able to speak to their experiences directly and attest to the value of prevention for their community.

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Community-Based

Advocacy-Focused

Data-Driven

Coalition-Building

Association