# Health Effects of Drugs

# From the National Institute on Drug Abuse (NIDA)

Cannabis (Marijuana)				
	ure of the dried, shredded leaves, stems, seeds, and/or flowers of Cannabis sativa or cannabis indica—the hemp			
Health Effects				
Acute	Heightened sensory perception; euphoria, followed by drowsiness/relaxation; impaired short-term memory, attention, judgment, coordination and balance; increased heart rate; increased appetite			
Long-term	Addiction: About 9 percent of users; about 1 in 6 of those who started using in their teens; 25 to 50 % of daily users. Mental disorders: may be a causal factor in schizophreniform disorders (in those with a preexisting vulnerability); is associated with depression and anxiety.			
Smoking related: chronic cough; bronchitis; lung and upper airway cancers is undetermined.				
In combination with alcohol	Magnified tachychardia and effect on blood pressure; amplified impairment of cognitive, psychomotor, and driving performance			
Withdrawal	Irritability, difficulty sleeping, strange nightmares, craving, and anxiety.			
Associated Special Vulnerabilities/Populations				
Youth	Almost 44 percent of teens have tried marijuana by the time they graduate from high school (MTF, 2010)			
Treatment options				

Medications	There are no FDA-approved medications to treat marijuana addiction.		
Behavioral	Cognitive-behavioral therapy (CBT)		
Therapies	Contingency management, or motivational incentives		
	Motivational Enhancement Therapy (MET)		
	Behavioral treatments geared to adolescents		
	(For more information on these treatments, please see NIDA's Principles of Drug Addiction Treatment: A		
	Research-Based Guide - Behavioral Therapies.)		

# Cocaine

White crystalline powder that can be snorted, injected or smoked				
Health Effects				
Acute	Dilated pupils; increased body temperature, heart rate, and blood pressure; nausea; increased energy, alertness; euphoria; decreased appetite and sleep.			
	High doses: Erratic and violent behavior, panic attacks			
Long-term	Addiction, restlessness, anxiety, irritability, paranoia, panic attacks, mood disturbances; insomnia; nasal damage and difficulty swallowing from snorting; GI problems; HIV			
In combination with alcohol	When combined, there is a greater risk of overdose and sudden death than either drug alone.			
Withdrawal symptoms	Depression, fatigue, increased appetite, insomnia or hypersomnia, vivid unpleasant dreams, psychomotor retardation or agitation			
Associated Special Vul	Associated Special Vulnerabilities/Populations			
Pregnancy	Premature delivery, low birth weights, and smaller for gestational age.			
Treatment options				
Medications	There are no FDA-approved medications to treat cocaine addiction.			

### Behavioral Therapies

- Cognitive-behavioral therapy (CBT)
- Community reinforcement approach plus vouchers
- Contingency management, or motivational incentives The matrix model
- 12-Step facilitation therapy

(For more information on these treatments, please see NIDA's Principles of Drug Addiction Treatment: A

Research-Based Guide - Behavioral Therapies.)

# **Prescription Stimulants (Abuse)**

Amphetamine (Dexedrine, Adderall), Methylphenidate (Ritalin, Concerta)

#### **Health Effects**

Acute	Increased alertness, attention, energy; irregular heartbeat, dangerously high body temperature, potential for cardiovascular failure or seizures.
Long-term	High doses especially, or alternate routes of administration (e.g., snorting, injecting) can lead to anxiety, hostility, paranoia, psychosis; addiction.
In combination with alcohol	Masks the depressant action of alcohol, increasing risk of alcohol overdose. May increase blood pressure; jitters.
Withdrawal symptoms	Depression, fatigue, increased appetite, insomnia or hypersomnia, vivid unpleasant dreams, psychomotor retardation or agitation

# Associated Special Vulnerabilities/Populations

Female adolescents	Unlike some illicit drugs and alcohol, stimulants are used at equal or greater frequency by young females vs. males. Use is often to lose weight, stay awake to study, or perform better on exams.
Mixing with antidepressants or OTC cold medicines	May enhance adverse effects; cause blood pressure to become dangerously high or lead to irregular heart rhythms.

#### **Treatment options**

Medications	There are no FDA-approved medications to treat stimulant addiction.
Behavioral Therapies	Behavioral therapies that have proven effective for treating addiction to illicit stimulant drugs, such as cocaine and methamphetamine, may be useful in addressing prescription stimulant addiction.
	(For more information on these treatments, please see NIDA's <u>Principles of Drug Addiction</u> <u>Treatment: A Research-Based Guide - Behavioral Therapies.</u> )

# Methamphetamine

White, odorless, bitter-tasting crystalline powder that is easily dissolved in water or alcohol; can be ingested orally, intranasally, injected, or smoked

Health Effects				
Acute	Enhanced mood; increased heart rate, blood pressure, body temperature, energy and activity; decreased appetite; dry mouth; increased sexuality; jaw-clenching			
Long-term	Addiction, memory loss; weight loss; impaired cognition; insomnia, anxiety, irritability, confusion, paranoia, aggression, mood disturbances, hallucinations, violent behavior; liver, kidney, lung damage; severe dental problems; cardiac and neurological damage; HIV, Hepatitis			
Withdrawal symptoms	Depression, anxiety, fatigue, and intense craving for the drug.			
Associated Specia	Associated Special Vulnerabilities/Populations			
Pregnancy	Increased risk of premature birth, placental abruption, fetal growth retardation, and heart and brain abnormalities			
Treatment options				
Medications	There are no FDA-approved medications to treat methamphetamine addiction.			
Behavioral Therapies	<ul> <li>Cognitive-behavioral therapy (CBT)</li> <li>Contingency management, or motivational incentives</li> </ul>			

The matrix model

Associated Special Vulnerabilities/Populations

12-Step facilitation therapy

(For more information on these treatments, please see NIDA's Principles of Drug Addiction Treatment: A

Research-Based Guide - Behavioral Therapies.)

# Inhalants

Volatile solvents, Aerosols, Gases, Nitrites (Poppers). Effects depend on the properties of the chemical, but inhalation is the common route of abuse

Health Effects	
Acute	Confusion; nausea; slurred speech; lack of coordination; euphoria; dizziness; drowsiness; disinhibition, lightheadedness, hallucinations/ delusions; headaches; suffocation; convulsions/seizures; hypoxia; heart failure; coma; sudden sniffing death (butane, propane, and other chemicals in aerosols)
	<b>Nitrites -</b> Systemic vasodilation; increased heart rate; brief sensation of heat and excitement; dizziness; headache.
Long-term	Myelin break down leading to muscle spasms, tremors and possible permanent motor impairment; liver/kidney damage.
	Addiction - A minority inhale on a regular basis, but among those, some report symptoms of addiction (need to continue using, despite severe adverse consequences).
	Nitrites - HIV/AIDS and hepatitis; lipoid pneumonia
In combination	Nitrites – Increased risk of adverse cardiovascular effects. Alcohol may increase the blood-vessel relaxant effect of organic nitrates (such as amyl nitrite) and result in dangerously low blood pressure.
Withdrawal symptoms	A mild withdrawal syndrome (e.g., irritability, restlessness, insomnia, headaches, poor concentration) can occur with long-term inhalant abuse.

Youth	Abused mostly by younger (8 <sup>th</sup> graders) rather than older teens (10 <sup>th</sup> and 12 <sup>th</sup> graders)				
	Nitrites have been linked to high risk sexual behaviors and HIV transmission. Because of their vasodilating actions on the anal sphincter, they are frequently used to facilitate anal intercourse by men who have sex with men.				
Pregnancy	Although rigorous studies have not been conducted, data from occupational exposure to abused solvents like toluene suggest increased spontaneous abortion and fetal malformations.				
Treatment options					
Medications	There are no FDA-approved medications to treat inhalant addiction				
Behavioral Therapies	There are no published reports of behavioral approaches for the treatment of inhalant abuse.				

# Prescription Sedatives, sleeping pills\*, or anxiolytics (Abuse)

Central nervous system depressants include barbiturates (e.g., Nembutal) and benzodiazepines (e.g., Valium, Xanax)

# **Health Effects** Acute Drowsiness, relaxation; overdose Long-term Tolerance, physical dependence, addiction In combination with Slows both heart rate and respiration, which can be fatal alcohol Withdrawal Discontinuing prolonged use absent a physician's guidance can lead to serious withdrawal symptoms, including seizures. For barbiturates, abrupt cessation can be life-threatening. symptoms Treatment options Medications Addicted patients should undergo medically supervised detoxification because the treatment dose must be gradually tapered.

Behavioral	Behavioral therapies, such as cognitive behavioral therapy, that have proven effective for treating
Therapies	addiction to other illicit substances may be useful in addressing addiction to prescription sedatives.
	(For more information on these treatments, please see NIDA's Principles of Drug Addiction Treatment: A
	Research-Based Guide - Behavioral Therapies.)

<sup>\*</sup> Although newer (non-benzodiazepine) sleep medications are thought to have less abuse/addiction liability, ER visits associated with their nonmedical use have been increasing, so these may also present a risk for patients taking them other than as prescribed.

# Hallucinogens LSD, PCP, Psilocybin, Salvia, Ketamine LSD Acute Elation, depression, arousal, paranoia or panic; impulsive behavior, rapid shifts in emotions; distortions in perception. Increased body temperature, heart rate, blood pressure; nausea; loss of appetite; sweating; dry mouth; jaw-clenching; numbness; sleeplessness; dizziness, weakness, tremors. High doses: Panic, paranoia, feelings of despair, fear of insanity and death. Frightening flashbacks, Hallucinogen Persisting Perception Disorder (HPPD). Low addictive potential; however, Long-term tolerance does develop Psilocybin Acute Low doses: Relaxation; altered sensory perception; increased energy, heart rate; decreased appetite High doses: Effects similar to LSD, including visual hallucinations, altered perceptions; nervousness, confusion, panic, paranoia Long-term Low addictive potential, however may produce tolerance Salvia

Acute	Short-lived, but intense hallucinations, altered visual perception, mood, body sensations; emotional swings,				
	feelings of detachment from one's body; highly modified perception of external reality and self; sweating				
Long-term	Unknown addictive potential				
PCP					
Acute	Low Doses: shallow, rapid breathing, increase in heart rate and blood pressure; nausea, blurred vision,				
	dizziness; numbness; slurred speech; confusion; loss of coordination; muscle contractions; analgesia; altered				
	perceptions; feelings of being separated from one's body				
	High Doses: Feelings of invulnerability and exaggerated strength; seizures, coma, hyperthermia				
Ketamine (similar	to PCP)				
Acute	Anxiety; agitation; insomnia; euphoria; excitement; slurred speech; blurred vision; irregular heartbeat				
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	Low Doses: Nausea; elevated blood pressure; sedation; analgesia; impaired attention; memory and motor				
	function				
	Higher Doses: Immobility; distortions of auditory and visual perceptions; feelings of being separated from				
	one's body and environment; hallucinations; memory problems				
Long-term	Cognitive impairment, including verbal and short-term memory; blurred vision; loss of coordination				
In combination	Increased risk of adverse effects				
w/alcohol					
Treatment options	Treatment options				
Medications	There are no FDA-approved medications to treat addiction to hallucinogens.				
Behavioral	There is no evidence base for treating abuse of or addiction to hallucinogens specifically.				
Therapies					

# MDMA (Ecstasy)

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Acute

Euphoria; increased energy, alertness, tactile sensitivity, empathy; decreased fear, anxiety; increased/irregular heartbeat; dehydration; chills; sweating; impaired cognition and motor function; reduced appetite; muscle cramping; teeth grinding/clenching; in rare cases—hyperthermia, rhabdomyolysis, and death.

Longterm Impulsiveness; irritability; sleep disturbances; anxiety addiction.

# Street Opioids (Heroin, Opium)

Processed from poppy plants; a white or brownish powder or black sticky substance known as "black tar heroin." Usually smoked or injected, could be taken orally (opium).

## **Health Effects**

Acute	Euphoria; warm flushing of skin; dry mouth; heavy feeling in extremities; clouded thinking; alternate wakeful and drowsy states; itching; nausea; depressed respiration
Long-term	Addiction; physical dependence; collapsed veins; abscesses; infection of heart lining and valves; arthritis/other rheumatologic problems; HIV; Hepatitis C
In combination with	Dangerous slowdown of heart rate and respiration, coma, or death
Withdrawal symptoms	Restlessness, muscle and bone pain, insomnia, diarrhea, vomiting, cold flashes with goose bumps ("cold turkey"), and leg movements.

### Associated Special Vulnerabilities/Populations

Pregnancy	Spontaneous abortions; low birth weight

### Treatment options

Medications	•	Methadone
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	Buprenorphine     Naltrexone (short and long-acting formulations)
Behavioral Therapies	<ul> <li>Contingency management, or motivational incentives</li> <li>12-Step facilitation therapy</li> </ul>
	(For more information on these treatments, please see NIDA's <u>Principles of Drug Addiction Treatment: A</u> <u>Research-Based Guide - Behavioral Therapies.</u> )

# Prescription Opioids (Abuse)

Hydrocodone, Oxycodone, Codeine		
Health Effects		
Acute	Pain relief, drowsiness, nausea, constipation, euphoria—in some.	
	When taken by routes other than as prescribed (e.g., snorted, injected), increased risk of depressed respiration, leading to coma, death. CDC reports marked increases in unintentional poisoning deaths since late the 1990s, due mainly to opioid pain reliever overdose (often in combination with alcohol or other drugs).	
Long-term	Tolerance, addiction	
In combination with alcohol	Dangerous slowing of heart rate and respiration, coma, or death	
Withdrawal symptoms	Restlessness, muscle and bone pain, insomnia, diarrhea, vomiting, cold flashes with goose bumps ("cold turkey"), and leg movements.	
Associated Special Vulnerabilities/Populations		
Youth	8-10% of high school seniors have used Vicodin nonmedically in the past year; ~5% have abused OxyContin	
Pregnancy	Spontaneous abortions; low birth weight	
Older Adults	The higher prevalence of pain in this population renders a greater number of prescriptions written for opioid medications. Unintentional misuse or abuse could have more serious health consequences for elderly patients	

because of comorbid illnesses (and multiple prescriptions), potential for drug interactions, and age-related
changes in drug metabolism.

# Treatment options

#### Medications

- Methadone
- Buprenorphine
- Naltrexone (short and long-acting)

## Behavioral

#### Therapies

Behavioral therapies that have proven effective for treating addiction to illicit opioid drugs, such as heroin, may be useful in addressing prescription opioid addiction.

(For more information on these treatments, please see NIDA's <u>Principles of Drug Addiction Treatment: A Research-Based Guide - Behavioral Therapies.</u>)

# **Androgenic Anabolic Steroids (Abuse)**

Synthetic substances related to testosterone. Promote growth of skeletal muscle (anabolic) and the development of male sexual characteristics (androgenic) Taken orally, or by injection in doses much higher than would be prescribed.

#### Health Effects

Health Effects		
Acute	Headaches, acne; fluid retention (especially in the extremities), gastrointestinal irritation, diarrhea, stomach pains, and an oily skin, jaundice, and hypertension. Infections can develop at the injection site.	
Long-term	Liver damage; CVD: high blood pressure; increases in LDL ("bad" cholesterol); and decreases in HDL ("good" cholesterol). Cardiac hypertrophy, atherosclerosis.	
	Addiction—different from other drugs since abuse is not driven by euphoric effects. Nevertheless, individuals often continue abuse despite adverse physical/social consequences. Currently, few users of anabolicandrogenic steroids (AAS) seek substance abuse treatment, but those that present with AAS addiction display a distinctive pattern of comorbid psychopathology, overlapping with that of individuals with other forms of substance dependence	
In combination	May be synergistic in precipitating impulsive violent behavior. (more research is needed)	

with alcohol	
Withdrawal symptoms	Mood swings, fatigue, restlessness, loss of appetite, insomnia, reduced sex drive, and steroid cravings, and depression—sometimes leads to suicide attempts.
	al Vulnerabilities/Populations
Males	Shrunken testicles, reduced sperm count, infertility, baldness, development of breasts, increased risk for prostate cancer and striae distensae when injected
Females	Facial hair, male-pattern baldness, changes in or cessation of the menstrual cycle, enlargement of the clitoris, deepened voice, circumscribed hypertrichosis
Adolescents	Stunted growth due to premature skeletal maturation and accelerated puberty changes
Treatment option	ns en
Medications	Some medications that have been used for treating steroid withdrawal restore the hormonal system after its disruption by steroid abuse. Other medications target specific withdrawal symptoms—for example, antidepressants to treat depression and analgesics for headaches and muscle and joint pains.
Behavioral Therapies	Some patients require assistance beyond pharmacological treatment of withdrawal symptoms and are treated with behavioral therapies. Physicians have found that supportive therapy is sufficient in some cases. *