

10 Facts About Heroin

March 2018



1. What is heroin and what does it feel like?

Heroin is the common name for the psychoactive drug, diacetylmorphineⁱ. It can be smoked, sniffed, inserted rectally or injected.

Heroin is processed from morphine, which is a naturally occurring substance extracted from opium poppy plants. The opium poppy has been cultivated for more than five thousand years for a wide variety of medicinal uses, most notably as an analgesic used in the treatment of pain.

Heroin was first synthesized from morphine in 1874. From 1898 through 1910, the German pharmaceutical company, Bayer, marketed it under the trademark name 'Heroin' as a cough suppressant and as a "non-addictive" morphine substitute. It grew in popularity until the U.S. government restricted its use through the Harrison Narcotics Act in 1914 and made it illegal in 1924 through the Heroin Act.

Heroin is currently classified as a Schedule I substance, which means that the federal government has determined that it has no currently accepted medical use and has a high potential for abuse.

People who use heroin describe a feeling of warmth, relaxation and detachment, with a lessening sense of anxiety. It is a powerful sedative, and due to its analgesic qualities, physical and emotional aches and pains can also be diminished. These effects appear quickly and can last for several hours, depending on the dosage and the mode of administration.ⁱⁱ

When it is injected or smoked, it is quickly introduced into the bloodstream and leads to an instant rush of euphoric pleasure.ⁱⁱⁱ In addition to pain relief and sedation, heroin use can also lead to constipation, nausea and respiratory depression, which causes shallow breathing, lowered blood pressure and reduced heart rate.^{iv} Prolonged use can lead to physical dependence. Some people who use heroin do so because this physical dependence means that if they stop using heroin, they will experience severe

withdrawal symptoms that will make them physically sick. Many others continue using heroin because it provides a feeling of comfort and safety.

2. What's the difference between heroin and other opioids, such as fentanyl, morphine and oxycodone?

Opioids are a class of drugs that act on opioid receptors in the brain. Signals sent to these receptors can block pain and lead to feelings of euphoria. Historically and currently, opioids are used both medically and non-medically. As such, there are both legal and prohibited sources of opioids.

Different types of opioids differ in a few key ways: the form of the drug (i.e. powder, tar, pill, liquid, etc.), how potent they are, how long their effects last and their potential for addiction. Whether or not a particular opioid is regulated and produced in a standardized manner also impacts its potency and safety.

- *Morphine* is a naturally occurring substance derived from the opium poppy plant often used to alleviate pain and other physical ailments. It was the first opiate to be synthesized and thus, its use predates the use of heroin or oxycodone. The U.S. classifies it in Schedule II, which means the federal government has determined that it has potential for misuse and dependence, but also has accepted medical use and can be prescribed to patients.
- *Heroin* is processed from morphine. It is classified as a Schedule I substance, which means the federal government has determined that it has no currently accepted medical use. However, heroin (diacetylmorphine) is available medically in some limited circumstances, particularly in Europe and Canada. In the U.S., almost all heroin comes from the unregulated market.

- *Oxycodone and Hydrocodone* are semisynthetic opioids derived from the opium poppy plant, are chemically similar to morphine and are used to treat acute and chronic pain. Unlike illicitly produced heroin, their production is regulated, which means they have consistent effects and can be made available in specified doses.^v Semisynthetic opioids are most commonly available in pill form. OxyContin is a controlled-release form of oxycodone so it is released gradually over a period of time. Oxycodone and hydrocodone are Schedule II substances, which means that the federal government has determined that it has accepted medical use.
- *Fentanyl* is one of the most powerful opiate-based painkillers, used to treat chronic pain patients who have developed a resistance to other less powerful opiates such as morphine or oxycodone. Its effects are active at much lower doses than other opiates and so, while the effects of fentanyl might be similar to longer lasting opiates such as heroin, morphine and oxycodone, its non-medical use is riskier due to its increased potency. Like morphine, fentanyl is a Schedule II substance.^{vi} In recent years, much of the U.S. heroin supply has been mixed with synthetically created illegal fentanyl, leading to skyrocketing overdose death rates. Illegal fentanyl is not regulated and is often mixed into heroin, with or without the user's knowledge, which has led to increased overdose deaths since 2013.^{vii}
- *Methadone and Buprenorphine* are opioids that have been approved by the U.S. Food and Drug Administration (FDA) as medications to treat opioid dependence. They act on same receptors in the brain as other opioids. Learn more in DPA's [About Methadone and Buprenorphine](#) booklet.

3. What happens if you mix heroin with alcohol or other drugs?

Nearly all people who use heroin use at least one other drug.^{viii} Some of these combinations are less risky than others. The overwhelming majority of heroin overdoses are caused by combining heroin with alcohol or other drugs, especially sedatives.^{ix} Some of the most dangerous and potentially fatal combinations are with:

- *Alcohol*. Consuming alcohol along with heroin significantly increases the risk of overdose because it leads to shallow breathing, lowered

blood pressure and heart rate, deep sedation or even a coma.^x

- *Benzodiazepines*. Commonly used for treating a number of conditions including anxiety and insomnia, benzodiazepines (Xanax, Valium, Restoril, etc.) are often used in conjunction with opioids such as heroin. Because both opioids and benzodiazepines can slow the rate of breathing, it is highly risky to mix the two. This combination can also make the overdose reversal drug naloxone less effective when it is used to try and save someone from an overdose.^{xi}
- *Cocaine*. Commonly known as a 'speedball' or 'dynamite', the use of heroin and cocaine together can pose serious risks. Heroin and cocaine have opposing effects on the central nervous system; heroin depresses it and cocaine stimulates it. Both heroin and cocaine can cause breathing difficulties and adversely affect a person's heart rate, which can lead to overdose.^{xii}

This also holds true for mixing other opioids such as morphine, fentanyl, oxycodone, hydrocodone, etc. with alcohol, benzodiazepines and cocaine – the effects are identical.

It is best not to combine these drugs, but if that is not possible, it is safer to use less of each drug.

4. Can using heroin once make you addicted?

No. You cannot become physically dependent on or addicted to heroin after one use.

Being physically dependent on a drug means that one needs the drug to function properly. Physical dependence on the drug takes time and repeated use to develop. Addiction, on the other hand, is compulsive behavior despite negative consequences. While definitions of addiction vary, it is clear that neither dependence nor addiction can occur after using heroin once.

While the rates of heroin use and addiction have risen rapidly in recent years, federal government survey data consistently shows that approximately 80% of people who use heroin do not become dependent on it.^{xiii}

5. How many people in the U.S. use heroin?

According to the 2016 National Survey on Drug Use and Health, 0.2 percent of people (roughly 475,000 people) aged 12 and older report using heroin in the past month, 0.4 percent (roughly 948,000 people) reported using it in the past year, and 1.8 percent (roughly 4,981,000 people) reported using at least once in their lifetime.^{xiv}

Despite slight variations from year to year, the use of heroin has increased over the past decade. One factor driving this increase has been transition from use of prescription opioids to heroin.^{xv xvi} Ninety-four percent of opioid-addicted people who switched from prescription opioids to heroin reported doing so because prescription opioids “were far more expensive and harder to obtain”.^{xvii} As a result, beginning in 2010, heroin overdose fatalities “began increasing rapidly across the country while fatal overdoses involving prescription opioids began to level off and even declined slightly.”^{xviii} Deaths from heroin overdose nearly tripled from 2010 to 2013.^{xix}

However, it is important to note that the vast majority of people who have ever used opioids – whether prescription medications or heroin – never develop problematic use.^{xx}

6. What are the signs and symptoms of heroin withdrawal?

Signs and symptoms of heroin withdrawal can include depression, stomach cramps, nausea, fever, sweating, vomiting and diarrhea.^{xxi} It is a severe flu-like illness and the severity of the symptoms typically peaks at around 2-3 days. If untreated, some of these symptoms, such as persistent vomiting and diarrhea, can lead to dehydration, elevated blood sodium level and heart failure. However, all of the symptoms can be treated with appropriate medical attention.^{xxii}

These symptoms can be avoided by taking a form of opioid agonist therapy such as methadone or buprenorphine.

7. How can you stop a heroin overdose?

The most effective way to halt and reverse an opioid overdose is by administering naloxone hydrochloride (also known as its brand name, Narcan™). Naloxone is a generic drug that was first approved by the US Food and Drug Administration (FDA) in 1971.^{xxiii} Naloxone’s only effect is to reverse respiratory failure resulting from opioid overdose. It has no psychoactive effect,^{xxiv} no potential for misuse,^{xxv} and does not lead to increases in drug use.^{xxvi} It is also not a controlled substance. It can be administered by intramuscular injection or by the Narcan™ nasal spray.

The chance of surviving an overdose, like that of surviving a heart attack, depends on how fast someone receives medical assistance. Multiple studies show that most deaths occur one to three hours after the victim has initially ingested or injected the drug. The time that elapses before an overdose becomes fatal presents a vital opportunity to intervene and seek medical help. One way that policymakers are helping encourage overdose witnesses to seek medical help is by passing “911 Good Samaritan” laws that exempt witnesses from arrest for drug use or possession. If the heroin is contaminated with fentanyl, an overdose can occur much quicker. Also, reversing an overdose if the heroin has any fentanyl will require more than one administration of naloxone. There is currently no opioid, including fentanyl, which is “naloxone resistant”

Signs of a heroin overdose include a limp body, shallow or slow breathing, pale or ashen skin, and loss of consciousness. Learn how to recognize and respond to an overdose in this [guide](#) on how to recognize the sign of an overdose.

8. What options are available to treat heroin dependence and addiction?

In the case of addiction, there are a number of different kinds of treatments available for people who need help, although most people who use heroin stop without any formal treatment.

Stopping heroin use can be challenging because people must endure the immediate process of physical withdrawal, which can involve symptoms such as anxiety, sweating, nausea, and diarrhea, among others. During this period, it can be difficult for many to avoid relapse, the inclination to go back to using heroin, in order to alleviate these symptoms.^{xxvii} Heroin relapse can be lethal since one’s tolerance for the drug can go down unexpectedly during periods of abstinence. There is also an increased likelihood of having severe breathing difficulties after a period of abstinence.

I. Medication Assisted Treatment (MAT):

The U.S. Food and Drug Administration (FDA) has approved three medications for use in treating opioid dependence: methadone, buprenorphine and naltrexone.

Each of these medications differ in how they work in the body- methadone and buprenorphine are also known as Opioid Substitution Treatment (OST) or Opioid Agonist Treatment (OAT) because they have effects similar to heroin and other opioids in the brain. Methadone and buprenorphine have been proven to save lives, reduce the risk of lethal relapse, improve quality of life and decrease crime, more so than any

other treatment option.^{xxviii} Despite extensive research on the efficacy of OST, their availability varies across the country and so many people in parts of the nation do not have access to these life-saving medications.

- *Methadone* was first used in the management of opioid dependence in the U.S. in the 1960s and it is commonly referred to as the ‘gold standard’ of opioid treatment given its long history and record of efficacy. It is an opioid agonist, which means that it acts in a manner similar to heroin and other opioids in the brain. It can be in pill, powder or liquid form and the dosage is tailored to the individual. When used in proper doses in maintenance treatment, methadone does not create euphoria but does reduce cravings and withdrawal.^{xxix} While very effective for many people, methadone is highly regulated in the United States which can be a burden for patients. It requires daily visits to a licensed Opioid Treatment Program (OTP) i.e. “methadone clinics”, observed dosing, and frequent urine tests.
- *Buprenorphine* is a partial opioid agonist, which means that it has many similar effects to opioids but comes with lower adverse risks. Unlike methadone, which must be obtained through an OTP, buprenorphine is available in the privacy of a doctor’s office through certified prescribers and one can receive prescriptions that can be filled at a local pharmacy. When appropriately prescribed and taken, it relieves withdrawal, reduces craving, and can help reduce lethal relapse risk. Prescribed in the U.S. as *Suboxone* or *Subutex*, buprenorphine is generally taken daily as a tablet dissolved under the tongue though there are slightly different formulations. *Suboxone* includes naloxone, the overdose reversal drug, which can help reduce the risk of overdose in case of relapse. Because buprenorphine pills can be taken home, they can be a better option for those concerned about the stigma associated with methadone clinics or who are unable to travel daily to a methadone clinic.
- *Naltrexone* – most commonly known as *Vivitrol* or *Revia* – is an opioid antagonist, which means that it blocks the effects of opioids in the brain. One cannot start naltrexone until they have fully detoxified from prior opioid use or it will induce withdrawal symptoms immediately. It can be taken in daily pill form or as a once-monthly injection to help avoid relapse to opioid use. It works by attaching to receptors in the brain that block the euphoric feelings associated with opioid use, which means that even if the patient uses heroin during the time period they are on naltrexone, they will not feel its psychoactive effects.^{xxx} Research

on naltrexone for opioid dependence is limited and many have concerns about the quality of evidence on its effectiveness. Studies show that participants prescribed naltrexone for opioid dependence are more likely to drop out early-on than if prescribed an agonist like buprenorphine.^{xxxi} In addition, those who remain on naltrexone have issues with medication adherence so that they may opt to skip dosages so that they can feel the euphoric effects of a relapse. Due to the fact that naltrexone sustains an abstinence-based recovery, this can mean that this increases the likelihood of lethal overdose during a single relapse

II. Psychosocial treatment for heroin dependence

The most widely available treatment options for heroin dependence are psychosocial treatments provided at specialty substance use treatment facilities. These treatments are delivered by a state-licensed or credential treatment provider such as a mental health therapist, social worker, psychologist or substance abuse counselor. They can be provided through individual, group, couples or family counseling sessions. Sessions can vary in frequency so people may attend them daily, a few times a week or weekly, based on clinical need.

The quality of these treatments vary widely depending on their underlying principles, the skill of the practitioner offering them, and whether or not they are evidence-based. They are generally abstinence-based, although there are a growing number of facilities across the country that are focused on reducing the harms associated with drug use and misuse. While psychosocial treatments can be a promising approach for treating heroin dependence, relapse can still be a common occurrence and many find that combining treatment with MAT is most effective.

Types of treatment facilities:

- *Outpatient* substance use treatment facilities are most prevalent across the United States. In an outpatient program, participants live in their home while commuting to treatment on a regular basis and, depending on treatment need and other factors, may attend several individual sessions and/or group sessions a week for several months.
- *Inpatient* substance use treatment facilities are rarer than outpatient facilities and often include more structure and supports for individuals, often in a hospital or other type of medical facility. These are generally for people with more severe health problems or who are also addicted to other substances. They provide support for up to 28 days before transitioning individuals to longer-term outpatient or residential treatment.

- *Residential* substance use treatment facilities are longer term and are for individuals with more intensive needs for structure and support beyond outpatient treatment alone.

Types of psychosocial treatments:

- *Cognitive behavioral therapy* is a treatment approach that involves individual or group sessions where individuals develop strategies to increase thoughts and behaviors that are adaptive for recovery.
- *Harm reduction therapy* involves interventions that aim to reduce heroin use and/or the problematic effects of heroin dependence, which may include reduced use, moderation, reduced risky practices or abstinence.

III. Substances not federally approved as treatment, but which have shown promising results:

- *Marijuana*. There is extensive research proving the effectiveness of marijuana for dealing with chronic pain.^{xxxii} Studies have shown that many patients substitute marijuana for opioids^{xxxiii} and it is being used by some rehabilitation centers to wean patients off opioids such as heroin.
- *Kratom* is a medicinal plant indigenous to Southeast Asia that acts on opioid receptors in the brain, helping many people overcome addiction, chronic pain, and other difficult-to-treat conditions. Many people have found that kratom is helpful for cutting back or quitting opioids.^{xxxiv}
- *Ibogaine* is a psychoactive drug naturally occurring in a West African shrub known as iboga. People have found that larger doses of ibogaine can significantly reduce withdrawal symptoms from opioids and can temporarily eliminate cravings.^{xxxv}

9. How can we reduce the harms associated with using heroin?

Some strategies that can be adopted while using heroin to reduce the harms associated with its use are:

- *Carry naloxone*. When using heroin, make sure you have at least one dose, if not more, of naloxone – the overdose reversal drug – and have it in plain view.
- *Try a small dose first*. It is best to first try a small amount of the heroin to check the effect and

- *Don't use alone*. Always use with someone else and take turns while using.

It is possible to overdose with heroin whether you are snorting, injecting or taking them in another form. Signs of an overdose or emergency include – if the person is awake but unable to talk, their body is limp, their breathing is shallow or slow, their skin is pale, ashen or clammy and if they are unconscious.

In such a case of emergency, administer naloxone if you have it and know how to administer it. If you suspect the heroin may contain fentanyl, administer more than one dose. Seek medical help even if naloxone has been administered.

10. What policies can help to reduce the harms associated with using heroin?

Many of the harms associated with heroin stem from its prohibition. Below are some of the policy solutions to address the harms associated with heroin.

- *Syringe Access*. Sterile syringe access programs help lower risks associated with injecting, especially the transmission of blood borne diseases like HIV, by limiting syringe sharing and providing safe disposal options. These programs also provide people who inject drugs with referrals to treatment, detoxification, social services and primary health care. Allowing non-prescription, over-the-counter sale of syringes, exempting syringes from paraphernalia laws and allowing doctors to prescribe syringes to their patients increases access to clean syringes.
- *911 Good Samaritan Laws*. Witnesses to an overdose often hesitate to call for help due to fear of police involvement. Because the chance of surviving an overdose depends greatly on how fast one receives medical assistance, it is essential that witnesses are given protection from criminal prosecution and civil litigation. 911 Good Samaritan laws provide such protection for witnesses to an overdose who call 911. This policy protects the witness from arrest and prosecution for simple drug possession, possession of drug paraphernalia and/or being under the influence. Most laws do not protect people from arrest for drug sales or other offenses.^{xxxvi}
- *Naloxone Access*. Naloxone Hydrochloride, sold under the brand name Narcan™, is a drug which blocks the effects of opioids on the brain and restores breathing when administered during an overdose. It is not psychoactive, has no potential

for misuse, and side effects are rare. It saves lives without increasing drug use or risk-taking behavior. Increasing access to naloxone does not promote an increase in drug use.^{xxxvii} Naloxone recently became available behind counter in several states and is often distributed by community-based programs, but access is still widely lacking as is funding for programs that distribute it.

- **Supervised Consumption Services (SCS).** Also called safe injection facilities (SIFs), drug consumption rooms or safer drug use services – are legally-sanctioned facilities designed to reduce the health and public order issues often associated with public injection and drug use. These facilities provide a safe space for people to consume pre-obtained drugs in controlled settings, under the supervision of trained staff, and with access to sterile injecting equipment. Participants can also receive health care, counseling, treatment and referrals to health and social services. Proven benefits of SCS include an increase in public order, a decrease in risky injection practices, transmission of infectious diseases and overdose, and an increase in access to medical and social services, among other things.^{xxxviii} There are over 100 SCS operating in 65 cities around the world, but none in the U.S. – yet. Several states have introduced legislation that would permit the authorization and implementation of SCS.
- **Access to Drug Checking Services.** Drug checking in a harm reduction service that can reduce overdose fatalities by detecting dangerous adulterants. By checking for dangerous adulterants found in street drugs, drug checking

helps users avoid using potentially dangerous substances like fentanyl. Drug checking is simple and quick – a substance is diluted with water, the testing strip is dipped in and a positive for an adulterant is revealed in seconds. These could potentially be accessed through drop-in centers or through existing syringe exchange programs.^{xxxix}

- **Heroin Assisted Treatment (HAT).** Pharmacological heroin is administered under strict controls in a clinical setting to those for whom other treatments have been unsuccessful. It has been shown to lead to improvement in health, wellbeing and social reintegration for those undergoing treatment. It has also proven to cause major reductions in illegal drug use, crime, disease and overdose.^{xi}

ⁱ European Monitoring Centre on Drugs and Drug Addiction, "Heroin drug profile,"

<http://www.emcdda.europa.eu/publications/drug-profiles/heroin#chemistry>

ⁱⁱ Drug Policy Alliance, "Drug Facts Video: Heroin" https://www.youtube.com/watch?v=Zm0Ywl0k_oE&list=PLf6y9tNpg8wNUJuOhvC89poKY8Ac4u-fP&index=3

ⁱⁱⁱ Drug Science: Independent Scientific Committee on Drugs, "Drug Information: Heroin" <http://www.drugscience.org.uk/drugs/opioids/heroin>

^{iv} D. G. Stott, and B. J. Pleuvry. "Relationship Between Analgesia and Respiratory Depression for MU Opioid Receptor Agonists in Mice," *British Journal of Anaesthesia* 67. No. 5 (1991): 603-07 doi:10.1093/bja/67.5.603.

^v Drug Policy Alliance, "Fact Sheet: Fentanyl and Synthetic Opioids," September 2016, <https://www.drugpolicy.org/sites/default/files/Synthetic-Opioids-Fact-Sheet.pdf>

^{vi} Drug Policy Alliance, "Fact Sheet: Fentanyl and Synthetic Opioids," September 2016,

<https://www.drugpolicy.org/sites/default/files/Synthetic-Opioids-Fact-Sheet.pdf>

^{vii} Centre for Disease Control and Prevention "Injury Prevention and Control: Opioid Overdose,"

<https://www.cdc.gov/drugoverdose/opioids/fentanyl.html>

^{viii} Centre for Disease Control, "Today's Heroin Epidemic," <https://www.cdc.gov/vitalsigns/heroin/index.html>

^{ix} Carl Hart, "Mixing sedatives such as heroin and alcohol increases the risk of lethal results," <http://dr.carlhart.com/mixing-sedatives-such-as-heroin-alcohol-increases-the-risk-of-lethal-results/>

^x Erowid, "Illicit drugs and drug interactions," https://erowid.org/psychoactives/health/health_article1.pdf

^x J.D. Jones et al. "Polydrug abuse: A review of opioid and benzodiazepine combination use" *Drug and Alcohol Dependence*, 125 (2012) 8-18

^{xi} J.D. Jones et al. "Polydrug abuse: A review of opioid and benzodiazepine combination use" *Drug and Alcohol Dependence*, 125 (2012) 8-18

^{xii} Release, "Poly drug use," <http://www.release.org.uk/poly-drug-use>

- ^{xiii} Substance Abuse and Mental Health Services Administration, "Preventing Heroin Use: Facts, Factors, and Strategies" <https://www.samhsa.gov/capt/sites/default/files/resources/heroin-brief.pdf>
- ^{xiv} "2016 National Survey on Drug Use and Health," Substance Abuse and Mental Health Services Administration (SAMHSA), Center for Behavioral Health Statistics and Quality; Rockville, Maryland, Tables 1.1A, 1.1B.
- ^{xv} Drug Policy Alliance, "A Public Health and Safety Approach to Problematic Opioid Use and Overdose," November 2016, http://www.drugpolicy.org/sites/default/files/Opioid_Response_Plan_041817.pdf
- ^{xvi} Warner, Margaret, Hedegaard, Holly, and Chen, Li-Hui. "Trends in Drug-poisoning Deaths Involving Opioid Analgesics and Heroin: United States, 1999–2012." CDC.gov. December 2014; Michelle Peavy, et al. "'Hooked On' Prescription-Type Opiates Prior to Using Heroin: Results from a Survey of Syringe Exchange Clients." *Journal of Psychoactive Drugs* 44, no. 3 (July/August 2012): 259-65; R.A. Pollini et al. "Problematic Use of Prescription-type Opioids Prior to Heroin Use among Young Heroin Injectors." *Substance Abuse Rehabilitation* 2, no. 1 (October 2011): 173-80; Goodnough, Abby, and Katie Zezima, "Drug Is Harder to Abuse, but Users Persevere." *The New York Times*, June 15, 2011, http://www.nytimes.com/2011/06/16/health/16oxy.html?_r=1; G.J. Unick et al. "Intertwined Epidemics: National Demographic Trends in Hospitalizations for Heroin- and Opioid-related Overdoses, 1993-2009." *Plos One* 8, no. 2 (February 2013).
- ^{xvii} Theodore Cicero, "The Changing Face of Heroin Use in the United States: A Retrospective Analysis of the past 50 Years." *JAMA Psychiatry* 71, no. 7 (July 2014): 821-26
- ^{xviii} Hedegaard, Holly, Chen, Li-Hui, and Warner, Margaret. "Drug-poisoning Deaths Involving Heroin: United States, 2000–2013." NCHS Data Brief, no. 190 (March 2015), <http://www.cdc.gov/nchs/data/databriefs/db190.pdf>
- ^{xix} *Ibid.*; see also Rudd, Rose et al. "Increases in Heroin Overdose Deaths - 28 States, 2010 to 2012." *Morbidity and Mortality Weekly Report*, CDC 63, no. 39 (October 2013): 849-54; Centers for Disease Control and Prevention, Data for Epidemiologic Research (CDC WONDER). <http://wonder.cdc.gov/>
- ^{xx} 23% of people who use heroin will become addicted to it - according to the Substance Abuse and Mental Health Services Administration <https://www.samhsa.gov/capt/sites/default/files/resources/heroin-brief.pdf>
- ^{xxi} Drug Science: Independent Scientific Committee on Drugs, "Drug Information: Heroin" <http://www.drugscience.org.uk/drugs/opioids/heroin>
- ^{xxii} Darke, S, Larney, S, Farrell, M, "Yes, people can die from opiate withdrawal" 2017 Feb; 112(2):199-200, doi: 10.1111/add.13512 <http://onlinelibrary.wiley.com/doi/10.1111/add.13512/full>
- ^{xxiii} Drug Policy Alliance, "Opioid Overdose: Addressing the Growing Problem of Preventable Deaths" February 2016, https://www.drugpolicy.org/sites/default/files/DPA%20Fact%20Sheet_%20Opioid%20Overdose%20-%20Addressing%20a%20National%20Problem%20%28Feb.%202016%29.pdf
- ^{xxiv} Substance Abuse and Mental Health Services Administration, "Opioid Overdose Prevention Toolkit," (Rockville, Maryland: SAMHSA, 2014) <http://store.samhsa.gov/product/Opioid-Overdose-Prevention-Toolkit-Updated-2014/SMA14-4742>
- ^{xxv} Maxwell et al., "Prescribing naloxone to actively injecting heroin users: a program to reduce heroin overdose deaths"; Substance Abuse and Mental Health Services Administration, "Opioid Overdose Prevention Toolkit"; D. Kim, K. S. Irwin, and K. Khoshnood, "Expanded access to naloxone: options for critical response to the epidemic of opioid overdose mortality," *Am J Public Health* 99, no. 3 (2009).
- ^{xxvi} Maya Doe-Simkins et al., "Overdose rescues by trained and untrained participants and change in opioid use among substance-using participants in overdose education and naloxone distribution programs: a retrospective cohort study," *BMC Public Health* 14, no. 1 (2014); Substance Abuse and Mental Health Services Administration, "Opioid Overdose Prevention Toolkit; L. Beletsky, J. D. Rich, and A. Y. Walley, "Prevention of fatal opioid overdose," *JAMA* 308, no. 18 (2012).
- ^{xxvii} Drug Policy Alliance, "About Methadone and Buprenorphine," 2006, <http://www.drugpolicy.org/sites/default/files/aboutmethadone.pdf>
- ^{xxviii} Pierce et al., "Impact of treatment for opioid dependence on fatal drug-related poisoning: a national cohort study in England," *Addiction*, Volume 111, Issue 2 (February 2016) 298-308, <http://onlinelibrary.wiley.com/doi/10.1111/add.13193/full>
- ^{xxix} Drug Policy Alliance, "About Methadone and Buprenorphine," 2006, <http://www.drugpolicy.org/sites/default/files/aboutmethadone.pdf>
- ^{xxx} "How Vivitrol Works to Treat Opioid Dependence After Detox," <https://www.vivitrol.com/opioid-dependence/how-vivitrol-works>
- ^{xxxi} Lee et al., "Comparative effectiveness of extended-release naltrexone versus buprenorphine-naloxone for opioid relapse prevention (X:BOT): a multicenter, open-label, randomized controlled trial," *The Lancet*, November 2017
- ^{xxxii} National Academies of Sciences, <http://www8.nationalacademies.org/onpinews/newsitem.aspx?RecordID=24625>
- ^{xxxiii} Lucas P, "Cannabis as an adjunct to or substitute for opiates in the treatment of chronic pain" *International Journal on Drug Policy*, 2012. <https://www.ncbi.nlm.nih.gov/pubmed/22880540>
- ^{xxxiv} Boyer, Edward W. et al, Self-treatment of opioid withdrawal using kratom (*Mitragynia speciosa* korth). *Addiction*. 103(6) 2008. 1048-1050. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3670991/>
- ^{xxxv} Multidisciplinary Association for Psychedelic Studies, <http://www.maps.org/research/ibogaine-therapy>
- ^{xxxvi} Drug Policy Alliance, "911 Good Samaritan Laws" 2016, <http://www.drugpolicy.org/resource/911-good-samaritan-laws-preventing-overdose-deaths-saving-lives>
- ^{xxxvii} Drug Policy Alliance, "What is Naloxone," 2016, <http://www.drugpolicy.org/resource/what-naloxone>
- ^{xxxviii} Drug Policy Alliance, "Supervised Consumption Spaces" 2017 <http://www.drugpolicy.org/resource/supervised-consumption-services>
- ^{xxxix} Dance Safe, "Drug Checking" <https://dancesafe.org/drug-checking/>
- ^{xl} Drug Policy Alliance, "Heroin Assisted Treatment (HAT)" <http://www.drugpolicy.org/resource/heroin-assisted-treatment-hat>