



Identifying the Signs of Addiction: Substance Use Disorders and the Opioid Epidemic

2 Hours

PDH Academy
PO Box 449
Pewaukee, WI 53072

www.pdhacademy.com
pdhacademy@gmail.com
888-564-9098

Course Description:

Health care practitioners often encounter patients with an illness with features that may also be symptoms of a substance use disorder. This course focuses on identifying the signs of substance use disorders with an emphasis on opioid abuse, a national epidemic, that has resulted in the number of overdose deaths involving opioids raising 6 times higher in 2017 than in 1999. On average 130 Americans die every day from an opioid overdose. This course will include case examples and interactive exercises to reinforce learning. The course will also examine the history of drug and opioid epidemics, assessing substance abuse disorders, and an in-depth review of the types of opioids.

Course Objectives:

After completing this course, learners will be able to:

- Identify the signs of substance use disorders with an emphasis on opioid use disorders in patients
- Discuss the causes and impact of the present opioid epidemic
- Recognize the types of opioids and their effect on patients
- Identify screening and assessment tools to assist in identifying substance use disorders

Outline

1. Substance Use Disorders
 - I. Medical and DSM 5 definition of addiction
 - a. Addiction
 - b. Dependence
 - c. Use disorder
 - II. Classification of substance use disorders
 - c. **Activity:** Identify classification of disorder usage
2. Review of classification of drugs and physical/behavioral signs of abuse
 - I. Alcohol
 - II. Caffeine
 - III. Cannabis
 - IV. Hallucinogens
 - V. Inhalants
 - VI. Opioids
 - VII. Sedatives, Hypnotics, and Anxiolytics
 - VIII. Stimulants
 - IX. Tobacco
 - X. Review questions**
3. Opioid Epidemic
 - I. Causes
 - II. Impact
 - a. Communities
 - b. Overdoses
 - c. Deaths
 - III. Review questions**
4. Types of Opioids
 - I. Opioid Agonist

- a. Opium
- b. Morphine
- c. Codeine
- d. Oxycodone
- e. Hydrocodone
- f. Propoxyphene
- g. Meperidine
- h. Diacetylmorphine
- i. Hydromorphone
- j. Methyl fentanyl
- k. Methadone
- II. Opioid Partial Agonist
 - a. Buprenorphine
 - b. Pentazocine
- III. Opioid Antagonist
 - a. Naloxone
 - b. Naltrexone
- IV. **Review questions**
Summary

Final Exam

1. There are as many as _____ risk factors for substance use and dependence.
 - a. 85
 - b. 10
 - c. 18
 - d. 72

2. A 16-year-old female presents for a schedule appointment with her pediatrician. When she signed for her appointment the receptionist noticed the patient had a flushed face with some muscle twitching and seemed unusually nervous. These observations would lead to believe the patient is suffering from:
 - a. Alcohol intoxication
 - b. Caffeine intoxication
 - c. Caffeine withdrawal
 - d. Stimulant intoxication

3. Two to three milligrams of fentanyl can induce respiratory depression, arrest and possibly death. Two to three milligrams of fentanyl are about the same as _____ to _____ individual grains of table salt.
 - a. 3 to 4
 - b. 6 to 8
 - c. 5 to 7
 - d. 10 to 15

4. _____ is a fentanyl analogue that has been estimated to be 10,000 times stronger than morphine.
 - a. Acetylfentanyl
 - b. Furanylfentanyl
 - c. Carfentanil
 - d. Oxycodone

5. Naloxone is primarily used to reverse the _____ effects of opioid overdose.
 - a. hypertension
 - b. hallucinogenic
 - c. severe mood disorders
 - d. pulmonary

6. Which of the following substances is a Schedule I drug under the Controlled Substance Act (CSA)?
 - a. marijuana.
 - b. fentanyl.
 - c. cocaine.
 - d. pentobarbital.

7. Under the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5), the inappropriate use of drugs is termed
- drug dependence.
 - illicit drug disorder.
 - substance use disorder.
 - addiction.
8. When heroin enters the brain, enzymes convert it to _____ and binds rapidly to opioid receptors.
- narcan
 - dopamine
 - heroin acetate
 - morphine
9. Marijuana users are ____ a. three times as likely _____ to abuse heroin.
- three times as likely
 - less likely
 - twice as likely
 - not likely
10. The likelihood that drug use will lead to addiction depends on the _____ with which it promotes dopamine release in the brain, the _____ of that release, and the _____ of that release.
- speed, intensity, reliability
 - intensity, speed, reliability
 - efficiency, speed, reliability
 - reliability, speed, intensity
11. Heroin use more than doubled among _____, during the past decade.
- young adults, aged 18-25 years
 - teens 14-17 years old
 - individuals over 40
 - adults, aged 25-35 years
12. In 2008, drug overdoses, mostly from opiates, surpassed auto fatalities as leading cause of accidental death in the United States.
- True
 - False
13. Nearly _____ percent of all drug-related emergency department visits in 2011 involved the use of meth.
- 3%
 - 8.2%
 - 6.5%
 - None of the above

14. In over 40 states, opioid overdoses increased about _____ percent from July 2016 through September 2017.

- a. 30
- b. 40
- c. 50
- d. 60

15. What are some treatment options for heroin and other opioid addictions?

- a. Medication Assisted Detox
- b. Medication Assisted Maintenance
- c. Psychosocial Interventions
- d. All of the above

Identifying the Signs of Addiction: Substance Use Disorders and the Opioid Epidemic

Earl Ledford, MSW, LCSW, CST, CAP, CET

Rene' Ledford, MSW, LCSW, BCBA

Addiction is not a spectator sport. Eventually, the whole family gets to play.

There was a time in the history of addictions it was believed that a person was addicted to a drug only if they needed the drug daily, or if they went through withdrawal symptoms (vomiting, seizures, cramps, death) when he/she abruptly stopped using the substance. There was a stigma that alcoholics and addicts were unemployed, poor, and from the inner city. Those are misconceptions. We now know that all substances do not pose the same risks and many addicted people do not use drugs or alcohol daily and do not experience physical withdrawal when they stop using and are employed and appear to be functioning normally.

Another misconception dealt with the differences between physical and psychological addiction. Physical addiction was thought to be the determining factor in addiction, and little was paid to psychological addiction. For example, many people believed that cocaine was not a dangerous drug because it was psychologically, but not physically, addictive.

The cocaine epidemic, between 1984 and 1990, in this country broadened the understanding of addiction. It is now known that physical and psychological changes characterize all addictions. Addiction is far more than physical or psychological dependency. Drug addiction is a brain disease that is characterized by compulsive, at times uncontrollable, drug craving, seeking, and continued use that persists even in the face of extremely negative consequences. Drug seeking becomes compulsive, in large part because of the effects of prolonged drug use on brain functioning and behavior. For many people, drug addiction becomes chronic, with relapses possible even after long periods of abstinence.

Addiction, Dependence and Substance Use Disorder

The terms used to describe or define problems people have with illegal, illicit, and prescribed drugs can be confusing. The terms addiction and dependence are used interchangeably with addiction being the term most commonly used by healthcare and mental health professionals as well as in the general population. According to Michael Quinn, in the sixteenth century, the word addict was an adjective, not a noun, and was used to identify an attachment to something or a devotion to practice. Early in the twentieth century, it became a practice to use addict as a noun to describe a person whose preference for a substance that led to dependence. The noun addiction became the condition of being addicted to a substance. (Addiction, n.d.).

The American Society of Addiction Medicine's short definition of addiction, "Addiction is a primary, chronic disease of brain reward, motivation, memory and related circuitry. Dysfunction in these circuits leads to characteristic biological, psychological, social and spiritual

manifestations. This dysfunction is reflected in an individual pathologically pursuing reward and relief by substance use and other behaviors.

Addiction is characterized by inability to consistently abstain, impairment in behavioral control, craving, diminished recognition of significant problems with one's behaviors and interpersonal relationships, and dysfunctional emotional response. Like other chronic diseases, addiction often involves cycles of relapse and remission. Without treatment or engagement in recovery activities, addiction is progressive and can result in disability or premature death." (American Society of Addiction Medicine, n.d.).

The National Institute of Drug Abuse's definition of dependence is, "a state in which organism functions normally only in the presence of a drug; manifested as physical disturbance when the drug is removed (withdrawal)." (National Institute on Drug Abuse. (n.d.). Physical dependence can become an issue with the regular use of many drugs including many prescription drugs, even when taken as prescribed. According to the American Psychiatric Association dependence resulting from taking prescription drugs as directed is a medical problem, not a mental health issue. (American Psychiatric Association's DSM5, 2013)

There are as many as 72 risk factors for substance use and dependence (Leshner, 1998). Included in these 72 risk factors are poverty, racism, social dysfunction, dysfunctional families, lack of education, poor parenting, and high-risk peer groups. Risk, environmental and genetic factors influence one's initial decision to use substances of abuse. Continued use of a substance because the effects are likable: mood is elevated, perception of situations appears more positive to user and emotional state seems to be improved. Someone who has an addiction is not able to stop using a drug even though there is a failure to meet work, social, or family obligations. Tolerance and withdrawal can result from continued long-term use. Withdrawal results when there is physical dependence, and the body and brain require more of the substance to reach the same level of effect (tolerance) and resulting drug-specific physical or mental symptoms if drug use is abruptly stopped (withdrawal). Prescribed pain medications taken as instructed might also result in the need for increasing dosages (tolerance).

Scenario One. During the last year, your co-worker's doctor has prescribed her benzodiazepine, Klonopin, to be taken every night for sleep. She has started to show signs of being anxious about needing the medication to fall asleep. She complains of being helpless to stop taking the drug by herself. After talking to her doctor, they were able to gradually taper off the drug and start using a sleep aid that was less harmful.

Scenario Two. One of your teammates on the company softball team has been taking Oxycontin to manage the pain in one of his shoulders and has been using higher doses, even though he has tried several times to cut down. He can't play softball unless he takes Oxycontin. His work performance has been declining, he's missing work, and avoiding you and other co-workers. Lately, he has missed more and more practices and continues to take the drug while his work and social life are suffering.

In which of these scenarios is addiction the problem?

If you picked scenario two, you are correct. The difference between addiction and dependence is compulsive drug use that continues despite the negative consequences.

The American Psychiatric Association (APA) does not use the terms addiction, dependence or drug abuse. The APA’s Diagnostic and Statistical Manual of Mental Disorders Fifth Edition (*DSM–5*), published May 18, 2013, Substance-Related and Addictive Disorders Section classifies substance use disorders by severity depending the number of criteria met. Table 1, Substance Use Disorder Severity Ratings, summarizes that criteria.

Impaired Control	Social Impairment	Risky Use	Pharmacological (Not necessary)
Take substance in larger amounts or over a longer period of time.	Failure to fulfill major role obligations at work, school or home.	Recurrent use in situations which it is physically hazardous.	Tolerance – requiring markedly increased dose or markedly reduced effect.
Persistent desire to cut down or manage; may report multiple failures.	Continue use despite having persistent or recurring social or interpersonal problems.	Continue to use despite knowledge of physical or psychological problems from use.	Withdrawal or attempt to avoid withdrawal.
Time obtaining, using or recovering from effects of use .	Important social, occupational, or recreational activities given up.		
Craving- can be at anytime; more likely when in environment of use.		Severity: Mild = 2 to 3 Moderate = 4 to 5 Severe = 6 or more	

Table 1 – Adapted from American Psychiatric Association’s DSM 5

The substance-related disorders encompass ten separate classes of drugs: alcohol; caffeine; cannabis; hallucinogens; inhalants; opioids; sedatives, hypnotics, and anxiolytics; stimulants (amphetamine-type substances, cocaine, and other stimulants); tobacco; and other (or unknown) substances. The defining feature of a substance use disorder is a group of cognitive, behavioral, and physiological symptoms that result when the individual continues using despite significant substance-related problems. The diagnosis of a substance use disorder applies to all ten classes except caffeine. As with dependence and addiction, the nature of substance use disorders is a change in brain circuits, particularly in individuals with severe disorders. These brain changes may result in repeated relapses and intense drug craving especially when exposed to similar or familiar drug use situations or environments.

Using Scenario Two from above, rate the severity of your teammate's use of Oxycontin. One of your teammates on the company softball team has been taking Oxycontin to manage the pain in one of his shoulders and has been using higher doses, even though he has tried several times to

cut down. He can't play softball unless he takes Oxycontin. His work performance has been declining, he's missing work, and avoiding you and other co-workers. Lately, he has missed more and more practices and continues to take the drug even though his work and social life are suffering. Using Table 1 rate the severity of your teammates substance uses disorder.

____ Mild

____ Moderate

____ Severe

If you rated his substance use disorder as severe, you are correct. Your teammate use of Oxycontin is severe because he:

1. is taking the substance in higher doses.
2. has tried several times to cut down.
3. fails to meet major role obligations.
4. continues to use despite recurring social and interpersonal problems.
5. is giving up important social and recreational activities, and
6. continues to use despite problems of use.

Each of the ten substance categories identified by the American Psychiatric Association (APA) has specific coding criteria listed in the APA's DSM 5 that are used by mental health and psychiatric professionals.

- Specific Drug Use Disorder
- Specific Drug Intoxication
- Specific Drug Withdrawal, except for Hallucinogens and Inhalant Disorder.
Cannabis and Caffeine withdrawal is new
- Other Specific Drug-Induced Disorders
- Unspecified Specific Drug-Related Disorder

This course will address the specific drug use disorder, specific drug intoxication, and specific drug withdrawal. Drug intoxication and drug addiction are not the same. The criteria for intoxication may be observed during an office visit while addiction or severity of a substance use disorder has to be assessed over a period of time using the criteria in table 1.

The International Statistical Classification of Diseases and Related Health Problems (ICD), a medical classification list by the World Health Organization (WHO) contains specific coding criteria for health care professionals for both diagnoses and procedures. The United States uses the 10th revision, ICD-10-CM. ICD-10-CM codes are also included in APA's Diagnostic and Statistical Manual of Mental Disorders Fifth Edition (*DSM-5*), published May 18, 2013. This course does not address the specific medical and mental health coding practices and procedures.

The coding criteria related to substance use disorders in the ICD-10-CM has a primary part of the code that first identifies Mental and Behavioral Disorders due to the substance involved. After the substance involved has been coded a specifier is added for (1) abuse and (2) dependence. Each specifier is further coded with 17 different extensions starting at uncomplicated and with intoxication (uncomplicated, delirium, with perceptual disturbance, or unspecified) followed by three additional specifiers with each having specifiers. An example is F10.121 is the code for Alcohol abuse with intoxication delirium coding with the ICD-10-CM. A similar code using the DSM 5 for a moderate or severe alcohol use disorder is comorbid, the ICD-10-CM code is F10.229. DSM 5 coding is limited to a coding under mild substance use disorder or moderate/severe substance abuse disorder.

“A copy of the ICD-10-CM can be downloaded by visiting the Centers for Disease Control and Prevention website, <https://www.cdc.gov/nchs/icd/icd10cm.htm>, and go to "FY 2016 release of ICD-10-CM" section. Select ICD-10-CM PDF format to access a PDF version of the document. It directs you to an index of compressed zip files. Within that index, select ICD10CM_FY2016_Full_PDF.ZIP. This zip folder contains five files. Open the final file labeled 'Tabular.'“(Practice Research. (n.d.). Substance use disorders and ICD-10-CM coding. Retrieved April 08, 2018, from <http://www.apapracticecentral.org/update/2015/09-10/substance-disorders.aspx>)

Effects of Drug Use on the Brain

Most addictive drugs affect the brain's reward center by flooding it with the neurotransmitter Dopamine. The reward center controls a person's ability to feel pleasure and motivates a person to repeat behaviors needed to thrive, such as eating and spending time with loved ones. The overstimulation of the reward center that occurs when drugs are taken causes an intensely pleasurable high that can lead people to desire the drug/addictive substance.

As a person continues to use drugs, the brain adjusts to the excess dopamine by making less of it, reducing the ability of cells in the reward center to respond to it, and reducing the number of receptor cells. The lack of response to dopamine reduces the high the person now feels compared to the initial high they felt when the drug was first taken- this effect is known as tolerance. Individuals may begin to consume more of the drug in attempts to achieve the initial high. The increase in tolerance can also lead individuals to get less pleasure from other activities they previously enjoyed such as family and social functions.

Long-term alcohol/drug causes other changes in the brain's chemical systems and circuits affecting functions that include:

- ▯ Learning
- ▯ Judgment
- ▯ Decision-Making
- ▯ Stress
- ▯ Memory
- ▯ Behavior

Genetic Component of Addiction

There is not a stand-alone risk factor that can predict if a person will become addicted to drugs. The more risk factors are affecting an individual, the more likely it is the chance that consuming drugs/alcohol can lead to addiction. Some of the more common risk factors are:

Genetics: the genes that people are born with account for about half a person's risk of developing a substance abuse disorder. Also, the presence of other mental health disorders can influence the risk of drug use and addiction.

Environment: the environments that people live, work, and play in can have many different influences and risk factors. Family and friends to socioeconomic status and general quality of life, peer pressure, history of physical and sexual abuse, early exposure to drugs, stress, and parental guidance can affect a person's likelihood of using drugs and alcohol to cope.

Development: the genetic and environmental factors discussed above interact with the development stages in a person's life to affect addiction risk. Using alcohol/drugs at any age can lead to addiction, however, the earlier the addictive patterns begin, the more likely it will progress to a substance use disorder. A neurologic locus within the frontal cortex is associated with deferring gratification. In adolescence and young adulthood that locus is not fully mature, making early exposure to substance use more likely to develop into addiction.

(Source: National Institute on Drug Abuse; National Institutes of Health; U.S. Department of Health and Human Services.)

Addiction and the Brain

The human brain registers all pleasures the same way regardless of how they originate, from a psychoactive drug, a monetary reward, a sexual encounter, or a satisfying meal. In the brain, pleasure releases the neurotransmitter dopamine. All drugs of abuse from nicotine to heroin and cocaine cause a powerful release of dopamine in the brain. The likelihood that drug use will lead to addiction depends on the speed with which it promotes dopamine release in the brain, the intensity of that release, and the reliability of that release. The more the "pleasure response" in the brain, the higher that person is at risk for developing a substance use disorder. The way a drug is consumed also influences how likely it is to lead to addiction. Smoking a drug or injecting it (IV use) compared to orally taking the drug, generally produces a faster, stronger dopamine release in the brain and is more likely to lead to a substance use disorder.

Brain's Reward Center

Addictive substances provide a shortcut to the brain's reward system by flooding it with the neurotransmitter dopamine. The brain then creates memories of the rapid sense of satisfaction that drugs create, and it creates a conditioned response to certain stimuli (related to drug use), and a person begins to crave the addictive substance. According to the current theory of addiction, dopamine interacts with another neurotransmitter, glutamate to take over the brain's system of reward-related learning. This reward-related learning system has an important role in linking activities needed for survival with pleasure and reward. The reward center in the brain includes areas involved with motivation, memory, and pleasure. Addictive substances stimulate

the reward center and overload it. Repeated use of addictive substance or engagement in addictive behavior causes nerve cells to be modified from liking the substance or behavior to the user needing the substance or behavior.

Tolerance

Over time the brain adapts to the abused addictive substance in a way that the drug becomes less pleasurable and begins to require higher amounts be consumed to experience the initial levels of pleasure. Rewards typically come with time and effort, however addictive substances provide a shortcut, and produce 2-10 times the amounts of dopamine that natural rewards do, and they do it significantly faster. When a person becomes addicted, brain receptors for dopamine become overwhelmed (due to the flooding of dopamine). When the receptors are overwhelmed they produce less dopamine, and some dopamine receptors are destroyed. As a result, dopamine has less of an impact on the brain's reward center. Individuals using addictive substances in time begin to realize the desired substance no longer gives them as much pleasure. They must take more of it to obtain the same dopamine "high" because their brains have adapted. This concept is known as tolerance.

After tolerance builds up, compulsions take over. The pleasure associated with an addictive drug or behavior subsides and the memory of the desired effect and the need to recreate it (the want for the drug) persists. The learning process discussed previously also plays an important role. The memories of initial drug use help create a conditioned response and intense cravings arise. A person begins to crave the abused drug. Cravings not only contribute to addiction cravings they also contribute to relapse. A person is at risk for relapse even after years of sobriety due to conditioned learning.

Dependence

When drugs are used in a manner or amount inconsistent with the medical or social patterns of culture, it is considered drug abuse. In addition to having abuse potential, most controlled substances, and illicit drugs can produce physical and psychological dependence. Let's explore the difference between the physical and psychological dependence.

Physical Dependence

Physical dependence refers to the changes that occur in the body after repeated use of a drug that requires the continued administration of the drug to prevent withdrawal symptoms. Withdrawal symptoms can range from mildly unpleasant to life-threatening. The severity of the symptoms depends on the drug used, the amount and how used, the combination of other drugs used, the frequency and how long used, and the age, sex, health, and genetic makeup of the user.

Psychological Dependence

Psychological dependence refers to the perceived need or craving for a drug. Individuals who are psychologically dependent on a drug often feel that they cannot function without the continued use of that substance. Physical dependence can disappear within days or weeks after drug use stops. Psychological dependence can last much longer and is one of the primary reasons for relapse.

Consequences of Addiction

Individuals who are addicted to a substance, typically do not stop using drugs until they have suffered enough negative consequences, and most importantly until they are ready to change. The most significant consequences of addiction are social, emotional, and psychological. Individuals in active addiction usually think of the physical and economic implications of addiction: "I don't have a serious addiction because my health is fine, and I haven't lost my job." What individuals fail to understand is that health decline and functional impairment are usually consequences of late-stage addiction. The damage that addiction does to a person's self-esteem and relationships is far more profound than the damage done in other critical areas of functioning. Individuals with active addiction hurt family members, friends, and other important people in their lives. ((Source: National Institute on Drug Abuse; National Institutes of Health; U.S. Department of Health and Human Services.)

Drug intoxication and drug addiction are not the same. This course presents drug intoxication signs and symptoms for each of the drug categories that may be observed during a person's visit to your office or organization. In order to assess the possibility of a mild, moderate, or severe drug use disorder (or addiction) the behaviors and conditions illustrated in Table 1 must be determined through a more in-depth information gathering. A person meeting any of the conditions presented in this course during an office visit should be referred for continued screening and assessment by a professional specializing in substance use disorders (addictions) treatment.

Substance Use Disorders, Identification, and Signs of Severe Use Disorder

Alcohol Use Disorder

The Journal of American Medical Association (JAMA) Psychiatry found from 2002 to 2013 problems drinking with alcohol increased by nearly 50 percent. Among women, alcohol abuse and dependence increased by 83.7 percent. Among black people, it increased by 92.8 percent. Among the poor (earning less than \$20,000) it rose by 65.9 percent.

Under the shadow of the current opioid addiction crisis in the United States (42,000 deaths in 2016), alcohol abuse is quietly on the rise (CDC reports there are 88,000 deaths a year). A new study published in *JAMA Psychiatry* reported occurrences of Alcohol Use Disorder (AUD) rose by 49 percent between 2000 and 2010. The report indicated one in eight American adults (12.7 percent) in the United States currently meets the criteria for AUD. The increase is even higher for women, minorities, and older age groups.

Excessive alcohol use increases the risk of developing serious health problems. The 2015-2020 U.S. Dietary Guidelines for Americans defines moderate drinking to be up to 1 drink per day for women and up to 2 drinks per day for men. The National Institute on Alcohol Abuse and Alcoholism (NIAAA) defines binge drinking as a pattern of drinking that produces blood alcohol concentrations (BAC) of greater than 0.08 g/dL. BAC of greater than 0.08 g/dL usually occurs after four drinks for women and five

drinks for men over a 2-hour period. Substance Abuse and Mental Health Services Administration (SAMHSA) defines binge drinking as consuming 5 or more drinks on the same occasion on at least one day in the past 30 days and heavy drinking as consuming 5 or more drinks on the same occasion on each of 5 or more days in the past 30 days.

Excessive drinking can put an individual at risk of developing an alcohol use disorder in addition to other health and safety problems. Genetics has also been shown to be a risk factor for the development of an AUD.

Signs of alcohol intoxication

- ▮ Breath that smells like alcohol
- ▮ Blackouts or seizures
- ▮ Enlarged pupils
- ▮ Eye movements that are faster than normal for you
- ▮ Fast heartbeats and slow breaths
- ▮ Loss of balance, or no ability to walk straight or stand still
- ▮ Nausea and vomiting
- ▮ Slurred or loud speech

Signs of alcohol withdrawal

According to the U.S. National Library of Medicine, the symptoms of alcohol withdrawal include:

- ▮ Anxiety or nervousness
 - ▮ Depression
 - ▮ Fatigue
 - ▮ Irritability
 - ▮ Jumpiness or shakiness
 - ▮ Mood swings
 - ▮ Nightmares
 - ▮ Not thinking clearly
- (Am I An Alcoholic? The Difference Between Casual Drinking and Alcoholism. (n.d.).

The American Psychiatric Association's DSM5 Diagnostic Criteria for Alcohol Intoxication

"A. Recent ingestion of alcohol.

B. Clinically significant problematic behavioral or psychological changes (e.g., inappropriate sexual or aggressive behavior, mood lability, impaired judgment) that developed during, or shortly after, alcohol ingestion.

C. One (or more) of the following signs or symptoms developing during, or shortly after, alcohol use:

1. Slurred speech.
2. Incoordination.

3. Unsteady gait.
 4. Nystagmus.
 5. Impairment in attention or memory.
 6. Stupor or coma."
- (American Psychiatric Association's DSM5, 2013, p. 497).

The American Psychiatric Association's DSM5 Diagnostic Criteria for Alcohol Withdrawal are:

- "A. Cessation of (or reduction in) alcohol use that has been heavy and prolonged.
- B. Two (or more) of the following, developing within several hours to a few days after the cessation of (or reduction in) alcohol use described in Criterion A:
1. Autonomic hyperactivity (e.g., sweating or pulse rate greater than 100 bpm).
 2. Increased hand tremor.
 3. Insomnia.
 4. Nausea or vomiting.
 5. Transient visual, tactile, or auditory hallucinations or illusions.
 6. Psychomotor agitation.
 7. Anxiety.
 8. Generalized tonic-clonic seizures."
- (American Psychiatric Association's DSM5, 2013, p. 499).

Alcohol Use Disorder Scenario

An older man in his late sixties and is a bit disheveled in appearance comes into your office and has a female friend with him. The female friend tells you that she found him earlier this morning trying to enter his apartment door. He was sweaty, his eyes were dilated, and his hands were trembling so badly that he could not get the key in the door. She said the older man kept calling her by another name and saying he was trying to get into his building because he had some work he needed to get done. She lives in the same neighborhood and believes he retired several years ago. They have chatted on several occasions and she believed he knows her real name. His speech is not slurred, and his eye movements are normal. He knows who he is but, also appears confused. He is unable to tell you the month or season. His nose and cheeks are red with tiny spider veins and his stomach distended and when he extends his hands out in front of him they are very tremulous. His demeanor is polite and apologetic to you and the staff. He tells you he has never had a problem with alcohol. When he was given an assessment for alcohol use he scored high.

The older man behavior in the scenario is best explained by:

- a. Alcohol Intoxication
- b. Alcohol Withdrawal

The answer is b. The older man's behaviors indicate he is experiencing alcohol withdrawal. Key indicators are sweating, hand tremors, scoring high on the alcohol assessment, lack of slurred speech and normal eye movements (no Nystagmus). Alcohol withdrawal is one of the most dangerous withdrawals and can lead to seizures, strokes, or heart attacks in high risk

patients. Withdrawal from a severe alcohol use disorder or “addiction” should be done in a medically supervised detox program. This scenario also describes some memory, confusion, or orientation difficulties that would also tend to infer that further assessment for a multitude of other disorders is probably needed. Age is also a good reason to do further assessment, as those who are older have decreased abilities to metabolize substances. This gentleman may never have been assessed as having a problem in the past, but because of his age and biological factors, his body may treat substances different now.



Typically, caffeine is not viewed as drug and, even more so, not associated with intoxication or problem behaviors. At the same time, it is the most widely used psychoactive substance. Other "drugs of abuse lead to specific increases in cerebral functional activity and dopamine release in the shell of the nucleus accumbens (the key neural structure for reward, motivation, and addiction). In contrast, caffeine at doses reflecting daily human consumption does not induce a release of dopamine in the shell of the nucleus accumbens but leads to a release of dopamine in the prefrontal cortex, which is consistent with its reinforcing properties." Neurologic Effects of Caffeine. (2017, April 12). Some of the signs of caffeine intoxication may, however, mimic behaviors associated with other substance use disorders. Sources of caffeine include coffee, tea, caffeinated soda, "energy" drinks, over-the-counter analgesics and cold remedies, energy aids (e.g., drinks), weight-loss aids, and chocolate. Caffeine is also increasingly being used as an additive to vitamins and to food products. More than 85% of children and adults consume caffeine regularly. Some caffeine users display symptoms consistent with problematic use, including tolerance and withdrawal.

The American Psychiatric Association's DSM5 Diagnostic Criteria for Caffeine Intoxication are:

- “A. Recent consumption of caffeine (typically a high dose well more than 250 mg).
B. Five (or more) of the following signs or symptoms developing during, or shortly after, caffeine use:
1. Restlessness.
 2. Nervousness.
 3. Excitement.
 4. Insomnia.
 5. Flushed face.
 6. Diuresis.
 7. Gastrointestinal disturbance.
 8. Muscle twitching.
 9. Rambling flow of thought and speech.
 10. Tachycardia or cardiac arrhythmia.
 11. Periods of inexhaustibility.
 12. Psychomotor agitation.”
- (American Psychiatric Association's DSM5, 2013, p. 503).

The DSM 5 estimates that 7% of the population may meet the criteria for caffeine intoxication. At a lower level of caffeine consumption, there may be signs of ringing of the ears and flashes of light. While higher doses of caffeine can increase the heart rate lower doses can slow the heart

rate.

The American Psychiatric Association's DSM5 Diagnostic Criteria for Caffeine Withdrawal are:

“A. Prolonged daily use of caffeine.

B. Abrupt cessation of or reduction in caffeine use, followed within 24 hours by three (or more) of the following signs or symptoms:

1. Headache.
2. Marked fatigue or drowsiness.
3. Dysphoric mood, depressed mood, or irritability.
4. Difficulty concentrating.
5. Flu-like symptoms (nausea, vomiting, or muscle pain/stiffness).”

(American Psychiatric Association's DSM5, 2013, p. 506).

Cannabis Use Disorder

Commercial-grade marijuana usually includes the leaves, stems, and the seeds of the cannabis plant and potency are approximately 1 and 6 percent. Hashish averaged 5 percent in the 1990's.

Sinsemilla comprises the buds and flowering tops of the female plants, where THC is most concentrated. The potency of sinsemilla can reach more than 30 percent THC.

The active chemical in marijuana, THC, acts in the part of the brain called the hippocampus and alters the way the brain processes information and the formation of our memories. On the other hand, studies have shown it can slow the progression of Alzheimer's. THC interacts with brain areas called the cerebellum and basal ganglia, which regulate balance, posture, coordination, and reaction time. The Drug Enforcement Agency classifies marijuana as a Class 1 controlled drug which is the highest classification for drug control.

One of the more reported side effects, between 20 and 30 percent of recreational marijuana users, is intense anxiety after taking the drug. Cannabis users can also have audio and visual hallucinations, along with psychosis, from the effects the marijuana has on the brain. The audio hallucinations include "looping" sounds, where one unique sound (usually one syllable in duration) will repeat over-and-over until it is either replaced by a different sound or the effects of THC begin to wear off. THC interrupts the later phases of REM

sleep, the point during the night that is most crucial to making the body feel re-energized when you wake up. Within a few minutes of inhaling marijuana, heart rate increases, by 20 to 50 beats per minute. When marijuana with other drugs the heart rate can double. This heart rate increase usually subsides relatively quickly, in about 20 minutes. (Looking for HELP - forums.cannabisculture.com. (n.d.). THC increases food enjoyment and interest in food, P appetite which is thought to be caused by the THC interacting with the cannabinoid receptors in a brain area called the hypothalamus.

“Marijuana intoxication produces effects including:

- Euphoria.
- Relaxation.
- Drowsiness.

- Altered sense of time.
 - Impaired memory.
 - Slowed reflexes and impaired motor skills.
 - Bloodshot eyes.
 - Increased appetite.
 - Dry mouth.
 - Increased heart rate.
 - Cognitive impairments.
 - Paranoia.”
- (Marijuana Abuse. (2017, September 25).

The American Psychiatric Association's DSM5 Diagnostic Criteria for Cannabis Intoxication are:

"A. Recent use of cannabis.

B. Clinically significant problematic behavioral or psychological changes (e.g., impaired motor coordination, euphoria, anxiety, sensation of slowed time, impaired judgment, social withdrawal) that developed during, or shortly after, cannabis use.

C. Two (or more) of the following signs or symptoms developing within 2 hours of cannabis use:

1. Conjunctival injection.
2. Increased appetite.
3. Dry mouth.
4. Tachycardia.

D. The signs or symptoms are not attributable to another medical condition and are not better explained by another mental disorder, including intoxication with another substance.

Specify if:

With perceptual disturbances: Hallucinations with intact reality testing or auditory, visual, or tactile illusions occur in the absence of a delirium."

(American Psychiatric Association's DSM5, 2013, p. 516).

The American Psychiatric Association's DSM5 Diagnostic Criteria for Cannabis Withdrawal are:

“A. Cessation of cannabis use that has been heavy and prolonged (i.e., usually daily or almost daily use over a period of at least a few months).

B. Three (or more) of the following signs and symptoms develop within approximately 1 week after Criterion A:

1. Irritability, anger, or aggression.
2. Nervousness or anxiety.
3. Sleep difficulty (e.g., insomnia, disturbing dreams).
4. Decreased appetite or weight loss.
5. Restlessness.
6. Depressed mood.
7. At least one of the following physical symptoms causing significant discomfort:
abdominal

pain, shakiness/tremors, sweating, fever, chills, or headache.” (American Psychiatric Association’s DSM5, 2013, p. 517).

Hallucinogen-Related Use Disorder

**"One pill makes you larger, and one pill makes you small
And the ones that mother gives you, don't do anything at all. Go ask Alice, when she's ten feet tall"
...White Rabbit,
Jefferson Airplane**

Hallucinogens can be found in the extracts some plants and mushrooms or manufactured. Typically, hallucinogens are divided into two broad categories: classic hallucinogens (such as LSD (d-lysergic acid diethylamide)) and dissociative drugs (such as PCP 4-phosphoryloxy-N, N-dimethyltryptamine). The effect of either type of drug, is often rapid, intense emotional swings and seeing images, hearing sounds, and feeling sensations that seem real but are not. National Institute on Drug Abuse. (n.d.). Common Hallucinogens and Dissociative Drugs.

Phencyclidine Use Disorder

Dissociative Drugs

PCP (Phencyclidine) hit the market in the 1950s as a general anesthetic for surgery. PCP, usually sold as a liquid or powder, can also come in pill form. PCP can be snorted, smoked, injected, or swallowed. Some users enhance the smoking of marijuana, tobacco, or parsley by sprinkling the smokes with PCP.

Ketamine—also known as K, Special K, or cat Valium—is a dissociative currently used as an anesthetic for humans as well as animals. Ketamine's odorless, tasteless, and amnesia-inducing properties are sometimes added to drinks to facilitate sexual assault.

DXM (Dextromethorphan) is a cough suppressant and expectorant ingredient found in some over-the-counter (OTC) cold and cough medications. Adolescents and young adults often abused DXM. Extra-Strength cough syrup and pills and gel capsules typically contain the same amount of DXM. OTC medications that contain DXM often also contain antihistamines and decongestants.

Salvia divinorum is a psychoactive plant common to southern Mexico and Central and South America. Salvia is typically ingested by chewing fresh leaves or by drinking their extracted juices. The dried leaves of salvia can also be smoked or vaporized and inhaled. (National Institute on Drug Abuse. (n.d.). Common Hallucinogens and Dissociative Drugs).

PCP (Phencyclidine)/Dissociative Drug use may cause the following signs:

- A sense of being separated from one's body and surroundings
- Hallucinations
- Problems with coordination and movement
- Aggressive, possibly violent behavior

- Involuntary eye movements
- Lack of pain sensation
- Increase in blood pressure and heart rate
- Problems with thinking and memory
- Problems speaking
- Impaired judgment
- Intolerance to loud noise
- Sometimes seizures or coma

The American Psychiatric Association's DSM5 Diagnostic Criteria for Phencyclidine Intoxication are:

“A. Recent use of phencyclidine (or a pharmacologically similar substance).

B. Clinically significant problematic behavioral changes (e.g., belligerence, assaultiveness, impulsiveness, unpredictability, psychomotor agitation, impaired judgment) that developed during, or shortly after, phencyclidine use.

C. Within 1 hour, two (or more) of the following signs or symptoms:

Note: When the drug is smoked, “snorted,” or used intravenously, the onset may be particularly rapid.

1. Vertical or horizontal nystagmus.
2. Hypertension or tachycardia.
3. Numbness or diminished responsiveness to pain.
4. Ataxia.
5. Dysarthria.
6. Muscle rigidity.
7. Seizures or coma.
8. Hyperacusis.”

(American Psychiatric Association’s DSM5, 2013, p. 528).

Hallucinogen Drugs

Classic hallucinogens, like LSD, affect serotonin neurotransmitters that help control functions such as behavior, mood, and perception. LSD and similar drugs over-stimulate serotonin, flooding the brain with signals that mimic psychosis and break down the user's inhibitions.

Peyote (Mescaline)—also known as buttons, cactus, and mesc—is a small, spineless cactus with mescaline as its main ingredient. Chemical synthesis is another source of mescaline.

DMT (Dimethyltryptamine), Dimitri, is a potent hallucinogenic chemical found naturally occurring in some Amazonian plant species is also chemically synthesized in the laboratory and usually takes the form of a white crystalline powder. The powder is typically vaporized or smoked in a pipe.

Ayahuasca—is a hallucinogenic brew made from plants found in the Amazon that contain DMT and a vine that has a natural alkaloid that prevents the normal breakdown of DMT in the digestive tract. The brew, tea, has traditionally been used for healing and religious purposes in indigenous South American cultures, mainly in the Amazon region. (National Institute on Drug Abuse. (n.d.). Common Hallucinogens and Dissociative Drugs).

LSD/Hallucinogens may cause the following signs:

- Hallucinations
- Greatly reduced the perception of reality, for example, interpreting input from one of your senses as another, such as hearing colors
- Euphoria.
- Relaxation.
- Drowsiness.
- Altered sense of time.
- Tremors
- Flashbacks, a re-experience of the hallucinations even years later

The American Psychiatric Association’s DSM5 Diagnostic Criteria for P Hallucinogen Intoxication are:

“A. Recent use of phencyclidine (or a pharmacologically similar substance).
B. Clinically significant problematic behavioral changes (e.g., belligerence, assaultiveness, impulsiveness, unpredictability, psychomotor agitation, impaired judgment) that developed during, or shortly after, phencyclidine use.
C. Within 1 hour, two (or more) of the following signs or symptoms:
Note: When the drug is smoked, “snorted,” or used intravenously, the onset may be particularly rapid.

1. Vertical or horizontal nystagmus.
2. Hypertension or tachycardia.
3. Numbness or diminished responsiveness to pain.
4. Ataxia.
5. Dysarthria.
6. Muscle rigidity.
7. Seizures or coma.
8. Hyperacusis.”

(American Psychiatric Association’s DSM5, 2013, p. 529).

There are no Withdrawal symptoms and signs for Hallucinogen-Related Use Disorders.

Inhalant Use Disorder



Inhalants

Things to Remember:
Very Short High,
Very High Dosage Rate,
High Addiction & Overdose Potential

Inhalant abuse refers to the intentional inhalation of vapors from commercial products or specific chemical agents to achieve intoxication. Inhalant use can increase the chances there will be damage to the heart, kidneys, brain, liver, bone marrow and other organs. Inhalants rob the body of oxygen which makes the heart to beat irregularly and more rapidly. The pleasure caused by inhalants of abuse, other than nitrites, is the result of the inhalant depressing the Central Nervous System

(CNS). Nitrites dilate and relax blood vessels rather than act as anesthetic agents. Abusers may inhale vapors directly from a container, from a bag into which a substance has been placed, or from a rag soaked with a substance and then placed over the mouth or nose (American Psychiatric Association [APA], 2000).

Intoxication occurs rapidly and is short-lived, although some abusers repeatedly or continuously self-administer inhalants to maintain a preferred level of intoxication. Most often used are shoe polish, glue, toluene, gasoline, lighter fluid, nitrous oxide or "whippets," spray paint, correction fluid, cleaning fluid, amyl nitrite or "poppers," locker room deodorizers or "rush," and lacquer thinner or other paint solvents. Most of these produce effects like anesthetics, which slow down the body's functions. After an initial high and loss of inhibition comes drowsiness, light-headedness, and agitation.

Most users of inhalants are teenagers, especially those who are 12 to 15 years old. Adult abusers tend to have higher rates of major depression, suicidal ideation and attempts, and anxiety and substance use disorders. (Bloomgren, V. (2015, May 19).

Signs of inhalant abuse include;

- chemical smells on clothing or breath
- chapped lips or faces
- slurred speech
- loss of appetite
- nausea
- runny noses
- a drunk or disoriented appearance
- paint or stains on skin or clothing
- inattentiveness,
- lack of coordination
- chemical and thermal burns
- ventricular arrhythmias (can lead to "sudden sniffing death")
- Unilateral or bilateral hearing loss
- Diffuse slowing of the EEG
- Wide-based ataxic gait

Inhalant users may also complain of headaches, dizziness, trouble remembering things, trouble sleeping, or vision problems. Long-term effects of inhalant use may include:

- liver and kidney damage
- hearing loss
- bone marrow damage
- loss of coordination and limb spasms (from nerve damage)
- delayed behavioral development (from brain problems)
- brain damage (from cut-off oxygen flow to the brain)

The American Psychiatric Association’s DSM5 Diagnostic Criteria for Inhalant Intoxication are:
 “A. Recent intended or unintended short-term, high-dose exposure to inhalant substances, including volatile hydrocarbons such as toluene or gasoline.

B. Clinically significant problematic behavioral or psychological changes (e.g., belligerence, assaultiveness, apathy, impaired judgment) that developed during, or shortly after, being exposed to inhalants.

C. Two (or more) of the following signs or symptoms developing during, or shortly after, inhalant use or exposure:

1. Dizziness.
2. Nystagmus.
3. Incoordination.
4. Slurred speech.
5. Unsteady gait.
6. Lethargy.
7. Depressed reflexes.
8. Psychomotor retardation.
9. Tremor.
10. Generalized muscle weakness.
11. Blurred vision or diplopia.
12. Stupor or coma.
13. Euphoria.”

(American Psychiatric Association’s DSM5, 2013, p. 538).

There are no criteria for withdrawal for Inhalant Use Disorder.

Stimulant Use Disorder

**Ticket to ride, white line
 highway Tell all your friends;
 they can go my way
 Pay your toll, sell your soul
 Pound for pound costs more
 than gold.....
 My white lines go a long way
 Either up your nose or through
 your vein
 With nothin to gain except killin'
 your brain..../ White Lines,
 Grandmaster Flash**

Stimulants are psychoactive substances that amplify the activity of specific neural signaling molecules that cause heightened energy and alertness. Stimulants include both legal substances, such as ADD medications like Adderall and Ritalin, as well as illicit substances like cocaine, crack, and methamphetamine, of which all are drugs of abuse. Stimulants, sometimes called “uppers,” temporarily increase alertness and energy. The most commonly used street drugs that fall into this category are cocaine and amphetamines.

Prescription stimulants come in tablets or capsules. When abused, they are swallowed, injected in liquid form or crushed and snorted."

Short-Term Effect

After the heightened energy and alertness, the high, a period of feeling exhausted, apathetic, and depressed, the down, is experienced. The "down" leads the stimulant user to want to use the drug again to get another "high." Continued use can lead to not trying to get "high," but to trying to get "well" and feel any energy at all. Some injection drug users may mix cocaine with heroin, which is called a "speedball."

Long-Term Effects

Stimulants can be addictive and repeated high doses of some stimulants over a short period can lead to feelings of hostility or paranoia. Such doses may also result in dangerously high body temperatures and an irregular heartbeat.

Signs and Symptoms

Each stimulant will have its host of effects and outcomes, but many of the stimulant drugs have several common symptoms associated with their use. Stimulant abuse causes over-excitation in the brain. This hyperstimulation can result in some notable effects including

- Euphoric feelings.
- Increased blood pressure.
- Rapid heart rate.
- Dangerously high body temperature.

These symptoms will last for the duration of the high last but will vary in intensity according to the dose taken. If the dose is high, these symptoms may be amplified to deadly overdose levels, potentially leading to heart attack, stroke, or seizures.

In some cases, certain substances, such as crack cocaine, can even cause delirium as well as symptoms of psychosis such as paranoia, delusions, and hallucinations.

Effects of Stimulant Abuse

Abusing stimulants can have significant short-term and long-term impact on a person's health. Even short-term use can result in problems like overheating, cardiovascular complications, seizures, neurotoxicity, and structural brain changes.

Physical Effects

Negative effects and medical complications of cocaine use may include.

- Extreme exhaustion.
- Significant weight loss.
- Cardiovascular damage.
- Heart rhythm disturbances.

- High blood pressure.
- Difficulty breathing.
- Gastrointestinal problems.
- Impotence in males.
- Infertility.
- Amenorrhea (absent menstrual cycle).
- Bloodborne diseases like HIV and hepatitis B, C, and D secondary to injection use.
- A headache.
- Stroke.
- Cerebral hemorrhage.
- Tremors or loss of muscle control.
- Seizure.

Psychological and Behavioral Symptoms

The negative consequences of stimulant use are not limited to physical problems. Many psychological and behavioral consequences are the result of chronic or long-term abuse:

- Paranoia.
- Delusions.
- Hallucinations.
- Extreme anxiety.
- Depression.
- Suicidal thoughts.

- **“In 1910, President William H. Taft told Congress that cocaine was the most serious drug problem the nation had ever faced.**
- **Almost 5,500 people died from cocaine overdose in 2014.**
- **Nearly 8.2% of all drug-related emergency department visits in 2011 involved the use of meth.**
- **The number of people reporting the current nonmedical use of stimulants, including meth, was higher in 2014 than almost every year between 2005 and 2012.”** (Died from Stimulant Overdose genealogy project. (n.d.).

Methylphenidate (Ritalin), Crack Cocaine (Crack), Methamphetamine (Meth) are among the most abused stimulants. Crack is a hazardous substance and ranked as being the third most damaging drug. Crack is highly addictive because it causes an intense high resulting from an 1100 percent increase in the dopamine level in the brain. When users smoke crack, they experience extreme euphoria. When the high wears off, the user becomes agitated, restless, paranoid, or irritable and leads to using again. Smoking crack at the expense of your finances, your relationships, or other important aspects of your life. (Crack Abuse. (2017, April 04).

Long-term meth use can also lead to significant weight loss, dental complications, and skin problems (such as sores and abscesses). (Addiction. (n.d.).

The American Psychiatric Association's DSM5 Diagnostic Criteria for Stimulant Intoxication are:

- "A. Recent use of an amphetamine-type substance, cocaine, or another stimulant.
 - B. Clinically significant problematic behavioral or psychological changes (e.g., euphoria or affective blunting: changes in sociability: hypervigilance: interpersonal sensitivity: anxiety, tension, or anger; stereotyped behaviors: impaired judgment) that developed during, or shortly after, use of a stimulant.
 - C. Two (or more) of the following signs or symptoms, developing during, or shortly after stimulant use:
 - 1. Tachycardia or bradycardia.
 - 2. Pupillary dilation.
 - 3. Elevated or lowered blood pressure.
 - 4. Perspiration or chills.
 - 5. Nausea or vomiting.
 - 6. Evidence of weight loss.
 - 7. Psychomotor agitation or retardation.
 - 8. Muscular weakness, respiratory depression, chest pain, or cardiac arrhythmias.
 - 9. Confusion, seizures, dyskinesias, dystonias, or coma."
- (American Psychiatric Association's DSM5, 2013, p. 567).

The American Psychiatric Association's DSM5 Diagnostic Criteria for Stimulant Withdrawal are:

- "A. Cessation of (or reduction in) prolonged amphetamine-type substance, cocaine, or other stimulant use.
 - B. Dysphoric mood and two (or more) of the following physiological changes, developing within a few hours to several days after Criterion A":
 - 1. Fatigue.
 - 2. Vivid, unpleasant dreams.
 - 3. Insomnia or hypersomnia.
 - 4. Increased appetite.
 - 5. Psychomotor retardation or agitation."
- (American Psychiatric Association's DSM5, 2013, p 569).

Sedative, Hypnotic, or Anxiolytic Related Use Disorders

Types of Anxiolytics, sedatives, and hypnotics

Sedatives, hypnotics, and anxiolytics (SHA) substances include several drug types. These are:

1. Anxiolytics (anti-anxiety) drugs such as benzodiazepines (e.g., Valium, Librium, Ativan, Klonopin, Rohypnol);
2. Barbiturates (e.g., Amytal, Nembutal, Seconal, Phenobarbital);
3. Other antianxiety and sleeping medications.

These drugs act as central nervous system depressants (like alcohol). For this reason, they are deadly when taken at high doses. They are also fatal at lower doses when combined with alcohol. The SHAs may be overused by people of any age group. Females are at higher risk than males for abusing prescription drugs in this class.

These substances often lead to tolerance and withdrawal and are highly lethal and have been instrumental in the deaths of the celebrities Marilyn Monroe, Judy Garland, Hank Williams, Heath Ledger, and Michael Jackson.

SHA addiction often occurs together with other drugs of abuse. This usually reflects an effort to counteract the effects of those other drugs. For example, people may abuse benzodiazepines to help them get rid of a high after using a stimulant. (Sedative-, Hypnotic-, Or Anxiolytic-Related Disorders. (n.d).

Barbiturates

Abusing barbiturates is extremely dangerous and can lead to severe short- and long-term physical and psychological symptoms, physical dependence, and accidental death. In 2007, The Lancet published an analysis of the harm caused by 20 “drugs of potential misuse”. Barbiturates were ranked:

- #3 for physical harm
- #4 for social harm
- #5 for dependence

Barbiturates are also taken with other CNS depressants to enhance their effects. This is extremely dangerous, because they multiply the effects them (for instance, 1 dose + 1 dose = 4 doses).

Here are some of the signs of barbiturate intoxication:

- ▮ Pronounced drowsiness
- ▮ Involuntary eye movement
- ▮ Slurred speech
- ▮ Loss of coordination
- ▮ Poor balance
- ▮ A wide-stance, unstable, and/or heavy walking gait
- ▮ Trembling in the extremities
- ▮ Writing abnormalities
- ▮ Inability to judge distances
- ▮ Cognitive impairment

▮ Depressed respiration

Withdrawal from barbiturates is perhaps more dangerous than from any other addictive substance. Symptoms manifest within 8 to 16 hours after the last dose and may include:

- Extreme agitation
- Heightened anxiety, to the point of panic
- Nausea
- Vomiting
- Dizziness
- Insomnia
- Uncontrollable tremors
- Severe visual hallucinations
- Psychosis resembling delirium tremens—up to 60% of patients
- Dangerously-high fever
- Neurological damage
- Circulatory failure
- Potentially-fatal seizures/convulsions

Most at-risk for barbiturate withdrawal are individuals who have a history of 90 days or more of taking any barbiturate with a short or intermediate half-life, such as amobarbital, butalbital, pentobarbital, or secobarbital.

No one should ever try to quit barbiturates on their own and detoxing should always be under the supervision of qualified medical personnel. (Barbiturate Abuse. (2016, July 21).

Benzodiazepines

Benzodiazepines, or “benzos,” are a class of sedative drugs administered for the relief of symptoms associated with anxiety and panic disorders, seizures, muscle spasms, and alcohol withdrawal. Sometimes heroin users use benzodiazepines to tie them over until they get more heroin. Common benzodiazepines include:

- Xanax
- Ativan
- Klonopin
- Valium

Benzodiazepine intoxication is frequently characterized by:

- Drowsiness
- Dizziness
- Double vision
- Slurred speech
- Muscle weakness
- Slowed reaction time

- Incoordination
- Poor concentration and memory
- Confusion
- Stupor

Withdrawal Symptoms

The appearance of withdrawal symptoms upon cessation of use is a clear sign that the user has developed a dependence on the drug. Benzo withdrawal symptoms include

- Anxiety
- Depression
- Insomnia
- Increased heart rate and blood pressure
- Excessive sweating
- Hand tremors
- Hallucinations
- Seizures

Depression, anxiety, and insomnia may occur for extended periods of time (for several months) following acute withdrawal from benzodiazepines and may contribute to relapse in recovering addicts.

An overdose on benzos may consist of any of the following:

- Severe dizziness
- Lack of coordination
- Profound confusion and altered mental status
- Unresponsiveness
- Blurred vision or other visual impairments
- Extreme agitation
- Amnesia
- Hallucinations
- Abnormally low blood pressure
- Respiratory depression
- Coma

Miscellaneous anxiolytics, sedatives and hypnotics

Drugs that fit in the miscellaneous anxiolytic, sedative and hypnotic include:

- Rozerem
- Lunesta
- Xyrem
- Belsomra
- Hetlioz

- Buspar
- Sonata
- Ambien
- Ambien CR

The effects sedative/sleep aide abuse/addiction differ between individuals, but may include:

- Next-day drowsiness
- Fatigue
- Dizziness
- Nausea and vomiting
- Delusions or hallucinations
- Somnambulism (sleepwalking)
- Coordination problems
- Amnesia or short-term memory loss

The American Psychiatric Association's DSM5 Diagnostic Criteria for Sedative, Hypnotic, or Anxiolytic Intoxication are:

- "A. Recent use of a sedative, hypnotic, or anxiolytic.
- B. Clinically significant maladaptive behavioral or psychological changes (e.g., inappropriate sexual or aggressive behavior, mood lability, impaired judgment) that developed during, or shortly after, sedative, hypnotic, or anxiolytic use.
- C. One (or more) of the following signs or symptoms developing during, or shortly after, sedative, hypnotic, or anxiolytic use:

1. Slurred speech.
2. Incoordination.
3. Unsteady gait.
4. Nystagmus.
5. Impairment in cognition (e.g., attention, memory).
6. Stupor or coma."

(American Psychiatric Association's DSM5, 2013, pg. 557)

The American Psychiatric Association's DSM5 Diagnostic Criteria for Sedative, Hypnotic, or Anxiolytic Withdrawal are:

- "A. Cessation of (or reduction in) sedative, hypnotic, or anxiolytic use that has been prolonged.
- B. Two (or more) of the following, developing within several hours to a few days after the cessation of (or reduction in) sedative, hypnotic, or anxiolytic use described in Criterion A:

1. Autonomic hyperactivity (e.g., sweating or pulse rate greater than 100 bpm).
2. Hand tremor.
3. Insomnia.
4. Nausea or vomiting.
5. Transient visual, tactile, or auditory hallucinations or illusions.
6. Psychomotor agitation.

7. Anxiety.
 8. Grand mal seizures."
- (American Psychiatric Association's DSM5, 2013, pg. 558)

A grand mal seizure may occur in up to 20%-30% of individuals undergoing untreated withdrawal.

Tobacco Use Disorder

The nicotine in any tobacco product readily absorbs into the blood when a person uses it. Upon entering the blood, nicotine immediately stimulates the adrenal glands to release the hormone epinephrine (adrenaline). Epinephrine stimulates the central nervous system and increases blood pressure, breathing, and heart rate. As with drugs such as cocaine and heroin, nicotine increases levels of the chemical messenger *dopamine*, which affects parts of the brain that control reward and pleasure. Studies suggest that other chemicals in tobacco smoke, such as acetaldehyde, may enhance nicotine's effects on the brain. (NIDA, 2018)

The American Psychiatric Association's DSM5 does not have criteria for nicotine intoxication. However, there may be signs of too much nicotine, especially in young people six years old and younger.

Nicotine Poisoning Signs

Nicotine primarily affects the heart and central nervous system, regardless of the amount you use. Too much nicotine can lead to toxicity. American Association of Poison Control Centers (AAPCC) reports that more than half of the Center's cases of nicotine poisoning in 2014 involved children younger than 6 years.

Symptoms may include:

- nausea
- vomiting
- increased blood pressure
- abnormal heart rate (arrhythmia)
- dehydration
- loss of appetite
- extreme fatigue
- dizziness
- headache
- gas
- anxiety
- hearing and vision changes

Tobacco Withdrawal Signs

The American Psychiatric Association's DSM5 Diagnostic Criteria for Tobacco Withdrawal signs are:

"A. Daily use of tobacco for at least several weeks.
B. Abrupt cessation of tobacco use, or reduction in the amount of tobacco used, followed within 24 hours by four (or more) of the following signs or symptoms:

1. Irritability, frustration, or anger.
2. Anxiety.
3. Difficulty concentrating.
4. Increased appetite.
5. Restlessness.
6. Depressed mood.
7. Insomnia."

(American Psychiatric Association's DSM5, 2013, p. 575).

Review Questions

1. What are the drugs that produce the most dangerous physical withdrawal?
 - a. Alcohol
 - b. Sedatives
 - c. Hallucinogens
 - d. Barbiturates
 - e. Both a. and d.

Answer: The correct answer is e. Alcohol and Barbiturates withdrawal should be done under medical supervision. Suddenly stopping alcohol or barbiturates can lead to seizures, strokes, or heart attacks

2. What are the signs of hallucinogen intoxication?
 - a. Drowsiness, dizziness, double vision, and slurred speech
 - b. Euphoria, relaxation, drowsiness, and altered sense of time
 - c. Nervousness, excitement, insomnia, and flushed face.
 - d. None of the above

Answer: The correct answer is b. Slurred speech and drowsiness is a sign of alcohol intoxication. Insomnia is a sign of stimulant or caffeine intoxication.

3. A chronic over dose of Meth refers to the _____, adverse health effects of ongoing methamphetamine abuse. The common signs of chronic overdose of meth are all the following except for:
 - a. Anxiety.
 - b. Extreme mood changes.
 - c. Severe mood changes.
 - d. Violent outbursts.
 - e. All are signs of chronic overdose of meth.

Answer: cumulative and e.

4. What are the signs of barbiturate withdrawal?

- a. Extreme agitation, dizziness, vomiting, and uncontrollable tremors.
- b. Involuntary eye movement, loss of coordination, pronounced drowsiness, and slurred speech.
- c. Excessive sweating, hand tremors, double vision, poor concentration and memory.
- d. Increased blood pressure, extreme fatigue, stupor or coma, and dehydration.

Answer: Choice a. is the correct answer.

5. The Center for Disease Control reported there are _____ deaths a year that are the result of excessive use of alcohol and the complications of withdrawal from the use of alcohol.

- a. 66,000
- b. 44,000
- c. 80,000
- d. 88,000

Answer: 88,000 deaths per year

Opioid Use Disorder

According to the National Institute on Drug Abuse:

- Drug overdose is the leading cause of accidental death in the United States.
- Over 100 Americans die every day from opioid overdoses.
- Roughly 25% of patients misuse their prescribed opioids for chronic pain.
- About 10% of patients who are prescribed opioids develop an opioid use disorder.
- About 80% of people who have previously used heroin, go on to misuse prescription opioids.
- In over 40 states, opioid overdoses increased about 30% from July 2016 through September 2017.
- The Midwestern region saw opioid overdoses increase about 70% from July 2016 through September 2017.

Three Main Types of Opioids		
Alkaloids (Natural Opiates)	Semi-synthetic	Fully Synthetic
Nitrogen-containing base chemical compounds that occur in plants such as the opium poppy.	Semi-synthetic/manmade opioids are created in labs from natural opiates.	Fully synthetic/manmade opioids are completely manmade.
Morphine, Codeine, Thebaine	Heroin, Hydromorphone, Hydrocodone, and oxycodone (OxyContin)	Fentanyl, Pethidine, Levorphanol, Methadone, Tramadol, and Dextropropoxyphene

Table 2. The National Institute on Drug Abuse Blog Team. (2014, July 16)

Center for Disease Control (CDC) monitors opioids under the following categories of opioids:

1. Natural opioid analgesics, including morphine and codeine, and semi-synthetic opioid analgesics, including drugs such as oxycodone, hydrocodone, hydromorphone, and oxymorphone;
2. Methadone, a synthetic opioid;
3. Synthetic opioid analgesics other than methadone, including drugs such as tramadol and fentanyl; and
4. Heroin, an illicit (illegally-made) opioid synthesized from morphine that can be a white or brown powder, or a black sticky substance (black tar heroin).

Three of these classes, natural opiates, semi-synthetic opioids, and synthetic opioids are commonly referred to as narcotic, or painkilling opioid drugs. The naturally occurring opiates are those which are found in the opium resin of the opium poppy. Although there are over 25 different alkaloids present in opium, morphine and codeine are the only two that are used as narcotic opiate analgesics. All other opioid analgesic medications are either semi- or fully-synthetic and are not found in nature. The semi-synthetic opioids such as hydrocodone, hydromorphone, oxycodone, and oxymorphone are derived from the naturally occurring opiates and opium alkaloids (morphine and thebaine especially). Fully-synthetic opioids such as methadone and fentanyl are synthesized from other chemicals and molecules that do not come from alkaloids found in opium. (Types of Opioids. (n.d.).

Opioids by Types of Receptor Binding			
Full Agonist	Partial Agonist	Mixed Agonist	Antagonist
Codeine			
Fentanyl			
Heroin			
Hydrocodone(Vicodin)	Buprenorphine	Buprenorphine	Naloxone
Hydromorphone(Dilaudid)	Butorphanol	Butorphanol	Naltrexone
Levorphanol	Pentazocine	Nalbuphine	Narcan
Meperidine (Demerol)	Tramadol	Pentazocine	
Methadone	Suboxone		
Morphine			
Oxycodone			
Oxymorphone (Opana)			

Table 3. Opioid Agonists, Partial Agonists, Antagonists: Oh My! (n.d.).

An agonist is a drug that activates certain receptors in the brain. Full agonist opioids activate the opioid receptors in the brain fully resulting in the full opioid effect. Examples of full agonists from the above table are heroin, oxycodone, methadone, hydrocodone, morphine, opium and others. Partial agonists are drugs that bind primarily to opioid receptors and cause them to produce endorphins but to a much lesser extent than full agonists.

An antagonist is a drug that blocks opioids by attaching to the opioid receptors without activating them. Antagonists cause no opioid effect and block full agonist opioids. Examples are naltrexone and naloxone. Naloxone (Narcan) is used to reverse the pulmonary effects of heroin and fentanyl overdose. Many cities are providing Narcan for first responders and emergency rooms. It gives first responders an additional 20-90 minutes to get treatment to someone who is overdosing.

Opioids Most Often Abused

Hydrocodone	Oxycodone	Codeine Morphine	Heroin	Fentanyl	
Most commonly prescribed opioid in the U.S. Derived from codeine & more potent than codeine.	Most commonly found in tablet or pill form. Derived from opium alkaloid.	Most commonly prescribed as a cough syrup in combination with another medication in tablet form.	Morphine is extracted from the seed pod of the Asian opium poppy plant.	Heroin is made by combining morphine with a chemical reagent called acetic anhydride.	Fentanyl is a synthetic opioid that is 50x more potent than heroin and 100x more potent than morphine.
Brand names include Vicodin, Lorcet, Vicoprofen	Brand names: Roxicodone, Oxecta, Oxycontin, Percocet	Brand name: In combination with other medications.	Brand names: MS-Contin, Oramorph SR, MSIR, Roxanol,	Brand name: Heroin is the brand name.	Brand names: Actiq, Duragesic, Sublimaze

Comparison Between Heroin, Fentanyl, and Carfentanyl

Heroin	Fentanyl	Carfentanyl
<ul style="list-style-type: none"> • Illegal drug with no accepted medical uses • Manufactured in powder form • Injected, smoked, or snorted when abused • Fast-acting and creates a short but intense rush • Natural opiate • Potential for rapid onset of overdose, leading to fatal respiratory depression • Highly addictive • Often requires medical detox and opioid replacement medications to safely process the drug out of the body • When it gets to the brain enzymes change it morphine which binds to the opioid receptors • Comprehensive treatment ideal for long-term recovery • Marijuana users are three times as likely, cocaine users 15 times as likely and opioid users are forty times as likely to become addicted to heroin as nonusers. • Heroin use more than doubled among young adults, aged 18-25 years, during the past decade. 	<ul style="list-style-type: none"> • Available by prescription as a powerful painkiller and manufactured illegally • Manufactured as a pill, patch, lozenge, tablet, an injectable liquid, and powder. • Ingested, snorted, smoked, or injected when abused • Fast-acting and creates a short but intense rush • Synthetic opioid • Lethal in much smaller doses and can be absorbed through the skin and incidental contact • Highly addictive • Often requires medical detox and opioid replacement medications to safely process the drug out of the body • Comprehensive treatment ideal for long-term recovery 	<ul style="list-style-type: none"> • Carfentanyl is an odorless, white powder. • Carfentanyl is an analogue of the synthetic opioid fentanyl • According to the National Institute on Drug Abuse (NIH), it has a quantitative potency approximately 10,000 times that of morphine and 100 times that of fentanyl. • Law enforcement officers and first responders have been warned that even touching a small amount of carfentanil powder with bare skin can cause severe effects • Law enforcement officers and first responders warned that even touching a small amount of carfentanil powder with bare skin can cause severe effects.

Table 4. (Fentanyl vs. Heroin: The Similarities and Differences between Two Powerful Opioids. (n.d.).

(Analysis | See how deadly street opioids like 'elephant tranquilizer' have become. (n.d.).

The American Psychiatric Association's DSM5 Diagnostic Criteria for Opioid Intoxication signs are:

“A. Recent use of an opioid.

B. Clinically significant problematic behavioral or psychological changes (e.g., initial euphoria followed by apathy, dysphoria, psychomotor agitation or retardation, impaired judgment) that developed during, or shortly after, opioid use.

C. Pupillary constriction (or pupillary dilation due to anoxia from severe overdose) and one (or more) of the following signs or symptoms developing during, or shortly after, opioid use:

1. Drowsiness or coma.
2. Slurred speech.
3. Impairment in attention or memory.”

(American Psychiatric Association's DSM5, 2013, p. 546).

The American Psychiatric Association's DSM5 Diagnostic Criteria for Opioid Withdrawal signs are:

“A. Presence of either of the following;

1. Cessation of (or reduction in) opioid use that has been heavy and prolonged (i.e., several weeks or longer).

2. Administration of an opioid antagonist after a period of opioid use.

B. Three (or more) of the following developing within minutes to several days after Criterion

A:

1. Dysphoric mood.
2. Nausea or vomiting.
3. Muscle aches.
4. Lacrimation or rhinorrhea.
5. Pupillary dilation, piloerection, or sweating.
6. Diarrhea.
7. Yawning.
8. Fever.
9. Insomnia.”

(American Psychiatric Association's DSM5, 2013, p. 547).

Some signs of fentanyl abuse include:

- Feelings of euphoria and relaxation
- False sense of well-being
- Confusion
- Sedation
- Drowsiness
- Dizziness/lightheadedness
- Nausea and vomiting
- Drug-seeking behavior (doctor shopping, forging prescriptions)
- Drug tolerance (needing more to achieve same effects)

- Constipation
- Respiratory depression or arrest

A fentanyl overdose will result in several characteristic physical symptoms. These symptoms will be easily observed by those who know what to look for, and include:

- Confusion
- Dizziness
- Difficulty thinking, speaking, or walking
- Pale face.
- Blue- or purple-colored lips, fingernails, or extremities
- Throwing up
- Choking sounds
- Pinpoint pupils (pupil size reduced to small black circles in middle of eyes)
- Seizures
- Low blood pressure
- Slowed heart rate
- Excessive drowsiness
- Frequent fainting spells (nodding off)
- Limp body
- Unresponsive
- Coma
- Difficulty breathing
- Hypoventilation (slow, shallow breathing)
- Respiratory arrest
- Death.

Once fentanyl overdose symptoms begin, it's important to get the user help as soon as possible to reduce long-term or even fatal consequences. Call 911 or seek emergency services as soon as possible.

Brief History of Opioids

Opium, the source of morphine, is obtained from the poppy, *Papaver somniferum* and *P album*. After incision, the poppy seed pod exudes a white substance that turns into a brown gum that is crude opium. Opium contains many alkaloids, any of numerous usually colorless, complex, and bitter organic bases containing nitrogen and usually oxygen that occur especially in seed plants and are typically physiologically active. The principal alkaloid in opium is morphine, which is present in a concentration of about 10%.

The term opioid describes all compounds that work at opioid receptors. The term opiate specifically describes the naturally occurring alkaloids: morphine, codeine, thebaine, and papaverine.

Heroin, morphine, codeine and other opiates trace their origins to a single plant—from the milky sap of a flower called the opium poppy. The earliest reference to opium use and the cultivation of opium poppies comes from Mesopotamia around 3,400 B.C. Opium use was popular in London, England during the early 1700's in the form of elixirs such as paregoric, commonly known as "pain soothers". (History of Codeine, n.d.)

Opium derivatives, including morphine, became widely used pain relievers, particularly in the 1800s. German scientist Friedrich Sertürner first isolated morphine from opium in 1803. Morphine, a very powerful painkiller, is the active narcotic ingredient in opium. In its pure form, morphine is ten times stronger than opium. (History.com Staff. (2017). The drug was widely used as a painkiller during the U.S. Civil War resulting in an estimated 400,000 soldiers becoming addicted. After the civil war, morphine use increased because of pharmaceutical companies and physicians pushing morphine products. The products were usually sold as a liquid in products like laudanum, an alcoholic solution containing morphine, and given to patients for pain or trouble sleeping. Mary Todd Lincoln, President Lincoln's wife, took it for migraine headaches and became addicted. (Stobbe, 2017)

Heroin, too, was first synthesized for medical use before physicians realized its potent addictive properties. By the second half of the nineteenth century, scientists had begun to look for a less addictive form of morphine, and in 1874, an English chemist named Alder Wright first refined heroin from a morphine base. The drug was intended to be a safer replacement for morphine. Bayer, a German pharmaceutical company, invented diacetylmorphine and named it heroin in 1898. It often came in pill form, without prescription, and was used to treat the flu and respiratory ailments. But it came to be sniffed, and later injected, by those looking for a more intense high or a substitute for other drugs, whether it was morphine in 1905 or opioid pain pills like Vicodin in 2015.

Dr. Paul Janssen of Janssen Pharmaceutica was the first to develop Fentanyl under a patent held by his company in 1959. Fentanyl is an opioid analgesic that is used as a surgical anesthetic in 70% of all surgeries in the U.S. because it is approximately 50-100 times more powerful than morphine. It binds to the opioid receptors in the brain in the areas that control pain and emotions. By the 1960s, Sublimaze was introduced as an intravenous anesthetic. Its popularity paved the way for the development of fentanyl analogues that included Lofentanil, Alfentanil, Remifentanil and Sufentanil.

There are two types of fentanyl: (1) Pharmaceutical fentanyl, which is primarily prescribed to manage acute and chronic pain associated with advanced cancer. (2) Non-pharmaceutical fentanyl, which is illicitly manufactured, and is often mixed with heroin and/or cocaine—with or without the user's knowledge—to increase the drug's effect.

The mid-1970s saw the first illicit use of pharmaceutical fentanyl and its analogues by members of the medical community – nurses, doctors, anesthesiologists and other medical health workers. They would draw fentanyl out from vials and replace it with a saline solution. Late into the decade, Fentanyl made its way into the streets with China White and became a popular street

drug on the west coast by the 1980s. It was also around the same time that fentanyl was introduced to the club scene in New York. (Fentanyl Abuse | Startling Facts About This Dangerous Synthetic Opioid. (n.d.). It only takes 2-3 milligrams of fentanyl to induce respiratory depression, arrest and possibly death (2 to 3 milligrams of fentanyl is about the same as five to seven individual grains of table salt). (United States, DEA, n.d.) Chronic pain patients were prescribed to wear a fentanyl patch it to manage their chronic pain. They wore it on their skin for 2-3 days at a time. Oral preparations were soon developed containing fillers including the buccal tablet Fentora and the Actiq lollipop. The Actiq lollipop was introduced for young cancer patients, but this form also became popular with club parties and all-nighters. (Fentanyl Abuse | Startling Facts About This Dangerous Synthetic Opioid. (n.d.).

Brief History of the Opioid Epidemic

Copied from <https://www.motherjones.com/crime-justice/2017/12/a-brief-blood-boiling-history-of-the-opioid-epidemic/> Julia Lurie January/February 2017 Issue
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“The scale of the overdose epidemic is hard to fathom. In 2016, overdoses claimed 64,000 lives—more than the US military casualties in Vietnam and Iraq combined. The origins of today’s crisis, a perfect storm of potent, easily accessible opioids, trace back to aggressive pharmaceutical marketing and liberal painkiller prescribing in the 1990s and 2000s. Here’s how it happened:

1970s: Percocet and Vicodin are introduced, but physicians are wary of prescribing them because of their addictive qualities.

1980: Article in the New England Journal of Medicine published Hershel Jick, MD’s article, “Addiction Rare in Patients Treated with Narcotics.” The article concluded out of almost twelve thousand patients treated with opiates while in a hospital before 1979, whose records were in the Boston database, only four had grown addicted.

1991: A brand of street heroin known as “Tango and Cash” was found to contain approximately 12 percent fentanyl and was believed to be responsible for an estimated 126 overdose deaths. (United States, DEA, n.d.)

1996: Purdue Pharma debuts OxyContin with the most aggressive marketing campaign in pharmaceutical history, downplaying its addictiveness. Over the next five years, the number of opioid painkiller prescriptions jumps by 44 million.

1998: Purdue distributes 15,000 copies of “I Got My Life Back,” a promotional video featuring a doctor saying opioids “do not have serious medical side effects” and “should be used much more than they are.” It also offers new patients a free first OxyContin prescription.

2001: The Joint Commission, a nonprofit charged with accrediting hospitals, promotes the now familiar 0-10 pain scale and begins judging hospitals based on patient satisfaction with pain treatment. The commission and Purdue team up on a guide for doctors and patients that says,

“There is no evidence that addiction is a significant issue when persons are given opioids for pain control.”

2002: US doctors prescribe roughly 23 times more OxyContin than they did in 1996; sales of the drug have increased more than thirtyfold.

2004: With input from a Purdue exec, the Federation of State Medical Boards recommends sanctions against doctors who undertreat pain.

2007: Three drug distributors—McKesson, Cardinal Health, and AmerisourceBergen—make \$17 billion by flooding West Virginia pharmacies with opioid painkillers between 2007 and 2012, according to a subsequent Pulitzer Prize-winning *Charleston Gazette-Mail* investigation.

2008: Drug overdoses, mostly from opiates, surpasses auto fatalities as leading cause of accidental death in the United States.

2009: The Joint Commission removes the requirement to assess all patients for pain. By now, the United States is consuming 99 percent of all hydrocodone and 81 percent of oxycodone.

2010: Cheap, strong Mexican heroin makes its way to American rural and suburban areas. Meanwhile, the Affordable Care Act offers addiction treatment coverage to many Americans for the first time. Annual OxyContin sales exceed \$3 billion.

2011: The Centers for Disease Control and Prevention declares that painkiller overdoses have reached “epidemic levels.”

2012: Health care providers write 259 million opioid painkiller prescriptions—nearly enough for every American to have a bottle of pills. The increasingly white face of addiction changes how policymakers frame the problem, from a moral failing necessitating prison time to a disease requiring treatment.

2013: Fentanyl is more frequently found to be mixed with the heroin supply. Most of it is illicitly produced in China.

2015: Seizures of fentanyl have multiplied by fifteenfold since 2013. About 12.5 million Americans report misusing painkillers; nearly 1 million report using heroin.

2016: An estimated 64,000 Americans die of drug overdoses—more than all US military casualties in the Vietnam and Iraq wars combined. In December, Congress passes legislation allotting \$1 billion to fund opioid addiction treatment and prevention efforts over two years.

2017: President Donald Trump declares the opioid epidemic a public health state of emergency. The president’s plan calls for ensuring first-responder access to naloxone, improving overdose tracking systems, and expanding access to medication-assisted treatment.

Epidemic Review Questions

1. Factors facilitating today's opioid epidemic include which of the following:
 - a. Doctors over prescribing pain medications.
 - b. Purdue Pharma's aggressive marketing of efforts for Oxycontin.
 - c. Articles in reputable journals concluding opiates were not addictive.
 - d. Federation of State Medical Boards recommends sanctions against doctors who undertreat pain.
 - e. All the above

Answer: The correct answer is e.

2. Drug overdoses kill more people than those killed in automobiles.
 - a. True
 - b. False

Answer: The correct answer is true.

3. The United States consumes the clear majority of the world's opioid painkillers: _____ percent of all hydrocodone and _____ percent of oxycodone.
 - a. 58 and 63
 - b. 63 and 58
 - c. 99 and 81
 - d. 81 and 99

Answer: 99 percent of all hydrocodone and 81 percent of oxycodone.

4. Two to three milligrams, about the same as _____ - _____ individual grains of table salt are enough fentanyl to induce respiratory depression, arrest and possibly death.
 - a. one to three
 - b. three to five
 - c. five to seven
 - d. ten to thirteen

Answer: five to seven

5. Carfentanyl is an analogue of the synthetic opioid fentanyl. According to the National Institute on Drug Abuse, it has a quantitative potency approximately _____ times that of morphine and _____ times that of fentanyl. Law enforcement officers and first responders warned that _____ a small amount of carfentanil powder with bare skin can cause severe effects.
 - a. 2000, 5000, ingesting
 - b. 3000, 6000, touching
 - c. 10,000, 100, touching

d. 5,000, 100, ingesting

Answer: c.

Treatment

To treat heroin and other opioid addictions, treatment programs must be able to address the unique needs of the addict helping them to regain the ability to function in both their personal and work life, while helping them to abstain from using opioids. Studies of heroin addiction treatment programs with methadone highlight the benefits and promising results of medication assisted detox and medication maintenance therapies combined with counseling, behavioral therapies, harm reduction education and interventions, and psychosocial support.

Medication Assisted Detox

Medically supervised withdrawal using methadone or buprenorphine reduces cravings and withdrawal symptoms and can be gradually tapered off over several days. Other antagonist drugs such as naloxone or naltrexone may be used in detox methods for rapid detox or in combination with non-opioid medications to ease withdrawal discomfort. Retention and detox completion are key elements to obtaining abstinence from opioids and this can be done in several ways, but, because the relapse rates run extremely high, detox alone is insufficient. According to the Substance Abuse and Mental Health Services Administration (SAMHSA), research has shown that retention in treatment over an extended period is key to successful outcomes for opioid addiction in many patients.

Medication Assisted Maintenance

Detox from opioids using methadone or buprenorphine are extended for a longer time under medication maintenance programs as determined by the addict's willingness to comply with the treatment programs, their treatment progression, and concerns regarding relapse. In the case of Black tar heroin addiction, treatment should be implemented slowly, and the longevity of these programs are beneficial to keeping the addict engaged in treatment and helping them to regain control of their life, while managing urges to use other opioids.

Other aims of this type of treatment are to improve functionality while reducing potential harm, whether to the addict or to others such as preventing the spread of diseases through needle sharing. Black tar heroin often contains impurities and because of the nature of its substance, repeated injections can have serious medical consequences along with high overdose and mortality rates.

Counseling and Behavioral Therapies

Counseling and behavioral therapies are necessary elements of treatment to help the addict identify, avoid, or cope with the issues surrounding their addiction. Cognitive behavioral therapy helps them to identify thought triggers that lead to periods of vulnerability and coping mechanisms to increase the likely hood use will be avoided.

Psychosocial Interventions

There are often co-existing mental health concerns, environmental issues such as abuse, violence, or homelessness, and social difficulties such as relationship problems, unemployment, financial difficulties, and legal problems that can contribute to opioid relapse if left unresolved. By providing medical and psychiatric services addicts can gain improvements that play an important role in long-term recovery outcomes.

Self-Help Groups

Self-help groups such as Alcoholics Anonymous and Narcotics Anonymous are highly advocated for relapse prevention and long-term recovery. These groups help the people to share the common concerns and interests of addictions between those who are undergoing similar recovery circumstances.

Summary

The accelerating heroin epidemic and use of other drugs is destroying lives in significantly higher numbers each year. Over time heroin users have increased the use of heroin with other drugs, especially cocaine and opioid analgesics. The increase in heroin use has caused an increase in heroin-related deaths. These alarming circumstances are addressed by the healthcare community through understanding addiction and the treatments and therapies for heroin, which is highly addictive.

Drug addiction and its treatment are complex and multifactorial. For the treatment of drug addiction to be successful all the substances which an individual is using must be addressed specifically. A portion of this course focused on heroin and opioid analgesics use disorder. It should be kept in mind that other substance use disorders can present very similar symptoms of addiction. Opioid addicts often use and may have an additional use disorder that must be considered to optimize the chance for long-term freedom from all illicit drug use.

Earl Ledford, MSW, LCSW, CST, CAP, CET
René Leford, MSW, LCSW, BCBA

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