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# Understanding and Addressing Substance Use: A Comprehensive Guide for Healthcare Professionals

## Section 1: Introduction

Substance use disorder is a global problem resulting in 2.6 million deaths each year (WHO, 2024). In the United States, 48.5 million people over age 12 reported having a substance use disorder in 2023. This jarring number accounts for over 17% of the United States population of persons older than age 12 (Substance Abuse and Mental Health Services Administration, 2024). With such widespread prevalence, nurses in every setting will encounter patients with current or past substance use disorder. Nurses must understand what substance use disorder is, be knowledgeable regarding the different types of substance use disorder, be able to identify and use terminology related to substance use disorders that is clinically accurate and person-centered, understand the science behind addiction, identify risk factors and protective factors, outline evidence-based treatments and prevention methods, and understand evidence-based nursing interventions in order to provide excellent care to their patients.

Substance use disorder is a mental health disorder where one or more substances are used that cause harm to mental or physical health or lead to clinically significant functional impairment. Modern neuroscience research has changed the way healthcare providers think about and treat substance use disorder. For thousands of years, individuals who were seen as “addicts” were thought to have a major character flaw. However, research has shown that there are neurochemical changes that are responsible for this mental health disorder. Today, substance abuse disorder is seen as a clinical diagnosis that is progressive, chronic, relapsing, and treatable (Volkow & Blanco, 2023).

As a condition, substance use disorder has a significant impact on communities and society as a whole. The use of illegal drugs and misuse of legal substances can cause significant acute and chronic health problems, including infectious, pulmonary, metabolic, cardiovascular, psychiatric, and oncological diseases. This

condition is associated with disability, early loss of life, crime, and stigmatization. There are also significant costs associated with substance use disorder, including loss of employment. Individuals with substance use disorder experience significant difficulty in controlling their substance use despite the effect it has on their health and social functioning (Volkow & Blanco, 2023).

Substance misuse occurs when an individual uses alcohol or drugs in a quantity, manner, situation, or frequency that could cause harm to themselves or others. The term substance misuse can describe a temporary or low severity situation, like one too many drinks at a holiday party, that increases risk for serious consequences, such as motor vehicle crashes or organ damage, or the term can be used to describe a more long-term and repeated experience of using substances to the point of increased risk for serious consequences. Substance use disorder more specifically describes a condition in which an individual repeatedly misuses substances despite encountering legal, occupational, social, and familial consequences (Open RN, 2022).

There are specific diagnostic requirements for substance use disorder. This condition can be diagnosed using the ICD-11 criteria or the DSM-5 criteria. According to the ICD-11, there must be a pattern of continuous, recurrent, or occasional use of a substance that has caused clinically significant damage to their health or the health of another. The harm caused to oneself must be due to the behavior related to intoxication, direct or secondary effects on body organs and systems, or a harmful route of administration. Harm to the health of others may include physical injury, trauma, or a mental disorder that is directly attributable to the person's behavior when they are intoxicated. The pattern of substance use must be over 12 months if it is sporadic or at least one month if there has been continuous use. The harm to the health of self or another individual must not be better attributed to another medical condition or mental health disorder (Volkow & Blanco, 2023).

The DSM-5 organizes diagnostic criteria into four categories: impaired control, physical dependence, social problems, and risky use (Gateway Foundation, 2025).

**Symptoms of these categories may include:**

- Taking the substance in larger amounts or for a longer period than intended
- Being unwilling or unable to decrease or stop use
- Spending significant time obtaining, using, or recovering from the substance
- Experiencing strong cravings for the substance
- Recurrent use that impairs the ability to fulfill major obligations at work, home, or school
- Continued use despite recurrent interpersonal problems caused by the substance
- Reducing or stopping important social, occupational, or recreational activities because of substance use
- Using the substance in situations that are physically dangerous
- Continuing use despite knowing it is causing or worsening physical or psychological problems
- Developing tolerance (requiring larger amounts to achieve the desired effect, or the usual amount no longer being effective)
- Experiencing withdrawal symptoms, or using another substance to avoid withdrawal

According to the DSM-5, meeting any two of the above conditions qualifies an individual for a diagnosis of substance use disorder (Volkow & Blanco, 2023; Gateway Foundation, 2025).

Substance use disorder can be further categorized as mild, moderate, or severe. If an individual experiences 2-3 symptoms of substance use disorder, it is considered mild. A moderate disorder is categorized as the individual experiencing 4-5 symptoms. Severe substance use disorder, also called addiction, is defined as the individual experiencing six or more symptoms. Addiction is a chronic illness, and individuals may experience relapse and recovery. Relapse describes the use of the substance after a significant period without using it. Recovery is a process that focuses on health and overall wellness. During recovery, individuals abstain from misusing substances, but that is not the only feature of recovery. When an individual has been in recovery for some time and can regain their health and social function, they are in remission. In 2020, 29.2 million adults in the United States reported having a substance use disorder in their lifetime, and 72.5% of those individuals considered themselves to be in recovery (Open RN, 2022).

## Section 1 Personal Reflection

Before continuing with this course, take time to do a self-inventory of your thoughts regarding substance use disorder. Identify any bias you may have. Consider your attitudes towards patients experiencing substance use disorder. As this course progresses, take the time to examine your biases and attitudes and examine them with an evidence-based, therapeutic approach.

How are substance use disorders like chronic medical conditions? Why do you think substance use disorders carry stigma when other conditions, like asthma, do not? What is the difference between substance misuse and substance use disorder?

## Section 2: Terminology

Terminology regarding substance use disorder has changed over time. Substance use disorder has been stigmatized, and negative bias is often associated with the disorder. The terms used may seem insignificant, but healthcare workers can work to reduce stigma and negative bias associated with substance use disorder by using language that facilitates improved outcomes. When an individual feels stigmatized due to their substance use disorder, they are less willing to seek treatment. Stereotyping can lead others to feel pity, fear, or anger for the individual, and they may choose to distance themselves socially. Stigmatizing language affects people's perceptions of substance use disorder. Using language that is person-first, accurate, and science-based is a helpful way to begin to address stigma among substance use disorder (National Institute on Drug Abuse, 2021).

Person-first language is an effective way to show respect for individuals who experience substance use disorder. It can also be effective to let them determine how they are described. This practice maintains the integrity of the individual as a whole person rather than equating them to their substance use disorder. Describing someone as a "person with a substance use disorder" is more appropriate than referring to them as an "addict" or, even more disparaging, using a slang term like "junkie". Person-first language allows the individual to feel like a person who has a problem, rather than themselves being the problem. Other words to avoid when referring to a person with substance use disorder are "substance or drug abuser", "user", "alcoholic", "drunk", "former addict", or "reformed addict". A person should also not be called "clean" or "dirty". Rather than "clean", they may be described as "testing negative", "being in remission or recovery", "abstinent from drugs", or "not currently or actively using drugs". Instead of the term "dirty", the person may be referred to as "testing positive" or a "person who uses drugs". This person-first terminology also extends to infants.

Instead of using “addicted baby”, it is more appropriate to describe these infants as a “baby born to a mother who used drugs while pregnant” or a “baby with signs of withdrawal from prenatal drug exposure,” or “baby with neonatal opioid withdrawal/abstinence syndrome” or simply a “newborn exposed to substances”. Evidence-based language reduces stigma and promotes better outcomes (National Institute on Drug Abuse, 2021).

Scientific-based terminology is preferred when documenting the care of an individual with substance use disorder. “Substance abuse” was a previously used clinical term, but is no longer used because it does not consider the neurobiological drivers associated with addiction. Currently, the terms “substance misuse” and “substance use disorder” are preferred terminology (Open RN, 2022). Instead of the term “habit”, clinicians should use “substance use disorder” or “drug addiction” to correct the assumption that the individual has control over their use and to qualify substance use disorder as a serious disease. Instead of “drug abuse,” it is recommended that the term “use” be used in the context of illicit drugs, and “misuse” or “used other than prescribed” be used in the context of prescription medications. Clinicians can use standardized terminology, like “mild”, “moderate”, and “severe,” to describe objective clinical levels of substance use disorder (National Institute on Drug Abuse, 2021).

## Section 2 Personal Reflection

Why is terminology important when discussing and documenting care for individuals with substance use disorder? What are some of the terms that have a negative connotation? How can using more person-centered terminology contribute to breaking the stigma associated with substance use disorder?

## Section 3: The Science of Addiction

Addiction is a chronic health disease and is categorized as a brain disorder because it changes the function of the brain regarding stress, rewards, and self-control. People may initially try a substance for various reasons. They may want to feel good and experience the initial euphoria and effects of the substance. Some may use a substance to cope with feelings of anxiety, stress, or depression. Others may use substances because they feel pressure to enhance their abilities at school, work, or athletics with stimulants. Some individuals, especially adolescents, may initially use a substance because of peer pressure or curiosity. Regardless of the initial motivation to use a substance, individuals often continue the use of the substance in this early phase because they think they control it, but find that eventually they are unable to control their use of the substance (National Institute on Drug Abuse, 2020). Over time, neuroadaptations, or changes, occur in the brain that drive substance misuse and can affect individuals for years after recovery (Open RN, 2022).

Substance use disorder is caused by a neurobiological strategy that causes humans to seek stimuli that have a positive reward and avoid stimuli that cause pain. Dopamine is a neurotransmitter that drives human motivation toward what the body perceives as a positive experience. When someone uses drugs, the dopamine response is activated at a concentrated level. This drives a person to seek the substance (Volkow & Blanco, 2023). All addictive substances directly or indirectly activate dopamine neurons (Open RN, 2022). The speed and magnitude of the dopamine response vary by drug. Substances that can trigger a larger and quicker dopamine response are more addictive. Once the brain associates specific conditions with the dopaminergic response, it becomes conditioned to anticipate the effects of the drug before the drug is taken. For example, if the drug is always used in a particular place or with particular objects, those become stimuli, and the brain is conditioned to respond to those circumstances. The more this experience

occurs, the more conditioned the brain becomes to expect the dopaminergic effects of the drug. This cycle strengthens the addiction to a substance (Volkow & Blanco, 2023).

Substance use disorder occurs as a spectrum (Volkow & Blanco, 2023). There is a typical pattern of progression associated with substance use disorder. First, an individual may be involved in experimental use of a substance, or even a valid use of a prescribed substance. This can progress to occasional use, such as using the substance in social settings or sometimes using a prescription medication not as directed. From this phase, an individual can become involved in heavy use of the substance, taking it routinely with no or few days off. Substance use disorder is the final phase of the progression and involves daily and consistent use of the substance (Cleveland Clinic, 2024e). When an individual experiences withdrawal symptoms following substance use, their body has become dependent on the substance (Open RN, 2022).

Addiction to a substance occurs when there is a repetitive cycle of intoxication, withdrawal, and craving (Volkow & Blanco, 2023). When an individual is intoxicated, they experience the pleasurable and rewarding effects of the substance. This is followed by withdrawal or negative affect (Open RN, 2022). The individual experiences dysphoria, depression, anxiety, irritability, anhedonia, or the inability to feel pleasure when they are not intoxicated. When addiction is present, the neural networks associated with reward and motivation, executive function, mood, stress reactivity, and self-awareness are disrupted (Volkow & Blanco, 2023). The last phase of the cycle is preoccupation or anticipation of substance use. After a time, the individual seeks the substance again, with increasing degrees of risk-taking. This leads back to the intoxication phase (Open RN, 2022).

Specific areas of the brain drive substance use disorder, including the basal ganglia, extended amygdala, and the prefrontal cortex. The basal ganglia is responsible for the reward center of the brain, producing euphoria and reinforcing the use of the substance. There are two subregions of the basal ganglia that are associated with substance use disorders. The nucleus accumbens motivates the person to misuse a substance and drives the reward experience. The dorsal striatum is the region involved in forming habits, or associations, with a substance, such as craving a cigarette upon waking in the morning. The extended amygdala is the brain region responsible for stress response, contributing to feelings of anxiety and irritability when the individual experiences withdrawal from a substance. The prefrontal cortex is responsible for executive function tasks, like organization, prioritization, time management, and decision making. Changes in the prefrontal cortex can reinforce substance misuse (Open RN, 2022).

The brain's reward center is one of the most primitive parts of the brain that drives survival. It reinforces the human behaviors that contribute to survival, like eating (Yale Medicine, 2022). During intoxication, the reward network is maximally stimulated (Volkow & Blanco, 2023) because the addictive substance causes an outsized dopamine response, ten times stronger than the natural reward (Yale Medicine, 2022). During the withdrawal phase, the brain is unable to respond appropriately to non-drug rewards. This decrease in sensitivity also contributes to increased amounts of the substance required to stimulate the reward response. When substance use interrupts executive function, individuals struggle to avoid risky behaviors, resist cravings for the substance, and delay gratification. Dysfunction in the prefrontal cortex weakens self-control and promotes impulsivity. Individuals who already experience prefrontal cortex dysfunction due to genetic factors, brain injury, or neurodevelopmental differences have increased risk for substance use disorder. Withdrawal reduces the dopamine response in the brain's reward network and impairs the mood network, including the amygdala,

habenula, and hypothalamus. This causes the brain to be more sensitive to stress. Interruption of self-awareness, or the interoceptive network, causes the brain to shift from goal-directed and flexible behaviors to compulsive and reflexive behaviors. The insula is the part of the brain that interprets physiological states and communicates them to the decision-making center of the brain, the anterior cingulate cortex. Exaggeration of insular activation increases cravings for the substance. The part of the brain involved in self-awareness and mind wandering becomes disproportionately focused on the internal feeling of discomfort due to the craving (Volkow & Blanco, 2023).

Over time and with continued use of the substance, these network disruptions, or neuroadaptations, significantly impact the structure and function of the brain. These changes may cause someone who uses a substance occasionally to develop an addiction and causes the use of the substance to be difficult to control. Eventually, the individual will use the substance not necessarily to experience the dopaminergic effects of the substance, but to avoid the feelings of withdrawal (Open RN, 2022). When someone is addicted to a substance, it can be incredibly difficult to stop using the substance, even if they want to, because of the functional changes that have occurred in their brain (National Institute on Drug Abuse, 2020).

## Section 3 Personal Reflection

How do the neurobiological strategies that drive survival also contribute to substance use disorder? How can specific areas of the brain influence the development of substance use disorder? Why is it biologically difficult to stop misusing a substance once it has already been misused?

## Section 4: Types of Substance Use Disorder

There are different types of substance use disorders, depending on the substance that is misused and the number of substances misused.

### Alcohol

Alcohol is the most widely used substance, with an estimated 2.3 billion users worldwide. The prevalence of alcohol use varies widely, with less than 1% of adults using alcohol in some countries and as many as 80% in other nations (Volkow & Blanco, 2023). Alcohol use disorder is also known as alcoholism. In the United States, in 2020 alone, 10.2% of Americans over age 12 experienced alcohol use disorder, resulting in approximately 385 deaths each day that were directly related to excessive alcohol use (National Center for Drug Abuse Statistics, 2025) The use of alcohol indirectly increases dopamine levels by enhancing multiple targets in the brain, including GABA, mu opioid receptors, and cannabinoid signaling (Volkow & Blanco, 2023).

Alcohol intoxication occurs when the level of alcohol in the bloodstream increases. There is a direct correlation between blood alcohol concentration and symptoms of intoxication. When intoxicated, individuals may experience inappropriate behavior, mood lability, poor judgment, slurred speech, poor coordination, and difficulties related to attention and memory. In cases of substantial intoxication, an individual may experience a total loss of memory of events that occurred while they were intoxicated. This is often referred to as a “blackout”. Extremely high blood alcohol levels can result in coma, brain damage, or death (Mayo Clinic, 2022). Critical symptoms of alcohol toxicity include stupor, difficulty maintaining consciousness, vomiting, seizures, respiratory rate less than eight breaths per minute, irregular breathing, bradycardia, clammy skin, absent gag reflex, hypothermia, and pallor (Open RN, 2022).

Alcohol withdrawal symptoms can be severe. When an individual stops or significantly decreases their alcohol consumption after using heavily or for a prolonged period, they will experience alcohol withdrawal symptoms. These may include sweating, tachycardia, hand tremors, insomnia, nausea and vomiting, hallucinations, agitation, anxiety, or seizures. These symptoms may occur 4-5 days after decreasing alcohol consumption or within several hours (Mayo Clinic, 2022).

To document a complete history of alcohol use, healthcare workers must understand what constitutes “one drink”. What one person considers “one drink” may vary significantly from another regarding the percentage of alcohol in the beverage or volume of the drink. The National Institute on Alcohol Abuse and Alcoholism has created a standard definition for “one drink”. It includes 12 ounces of regular beer (approximately 5% alcohol), or 8-9 ounces of malt liquor (approximately 7% alcohol), or 5 ounces of wine (approximately 12% alcohol), or 1.5 ounces of liquor (about 40% alcohol) (Mayo Clinic, 2022). Having a standard definition of “one drink” can help nurses determine the presence or severity of an alcohol use disorder when they screen patients for substance use disorder. The term “heavy drinking” is used to describe a female who drinks eight or more drinks per week or a male who consumes 15 or more standard drinks per week. The term can also be used to describe the behavior of a male or female who has experienced binge drinking on five or more days in the past thirty days. Binge drinking is defined as five or more standard drinks for a male or four or more standard drinks for a female within one occasion (Open RN, 2022).

The medical consequences of long-term alcohol use disorder include alcohol-induced cardiomyopathy, alcohol-induced hepatitis, alcohol poisoning, cerebellar degeneration, cirrhosis of the liver, and delirium tremens (Cleveland Clinic, 2024a). Alcohol-induced cardiomyopathy occurs when the ventricles become dilated and cardiac function declines. This condition is one of the leading causes of non-ischemic cardiomyopathy. While alcohol-induced cardiomyopathy is

attributed to chronic alcohol use, there is no specific quantity associated with the condition (Shaaban et al., 2023). Alcohol-induced hepatitis results in rapid-onset jaundice and elevated liver enzymes (Keating et al., 2022). Alcohol poisoning is a common term used for alcohol overdose, which occurs when so much alcohol is consumed that the brain is no longer able to regulate basic functions, such as breathing (National Institute on Alcohol Abuse and Alcoholism, 2024). Cerebellar degeneration can lead to disorders of movement, balance, speech, and vision (National Institute of Neurological Disorders and Stroke, 2024). Cirrhosis of the liver is the term for advanced scarring of the liver that causes organ dysfunction (Mayo Clinic, 2025a). Delirium tremens is an extreme form of alcohol withdrawal that can be life-threatening (Cleveland Clinic, 2023b).

## Caffeine

Caffeine is one of the most widely used substances in the world and is a central nervous system stimulant (Sajadi-Ernazarova & Hamilton, 2023). It is estimated that over 80% of adults in Western countries use caffeine daily, with an average intake of 122-226 mg per day (Booth et al., 2020). Caffeine is legal, inexpensive, and unregulated in most countries, contributing to its prevalent use (Sajadi-Ernazarova & Hamilton, 2023).

The daily recommended limit for caffeine consumption is 400mg, with an estimated 1 in 5 caffeine users exceeding that limit. Caffeine is found in coffee, tea, carbonated beverages, energy drinks, some supplements, and chocolate (Booth et al., 2020), though the caffeine content in each product varies widely. After caffeine is ingested, absorption into the bloodstream is rapid, with peak concentration occurring within 30-45 minutes. Caffeine has a half-life of 4-6 hours, is metabolized by the liver, and is excreted in the urine (Sajadi-Ernazarova & Hamilton, 2023).

Caffeine is a competitive adenosine receptor antagonist, which prevents the drowsiness caused by adenosine. Research has found that people who regularly consume caffeine have more adenosine receptors, making them more sensitive to adenosine. Many substances associated with substance use disorders cause adenosine to trigger dopamine dopaminergic activity in the nucleus accumbens. However, caffeine triggers a dopamine release in the prefrontal cortex, which lessens its addictive potential. Caffeine also stimulates glucose utilization in the caudate nucleus, affecting motor activity and sleep-wake cycle regulation (Sajadi-Ernazarova & Hamilton, 2023).

Caffeine has physiological effects on the cerebral vascular system, blood pressure, respiratory function, gastric and colonic activity, urine volume, and exercise performance. Research has found that low doses of caffeine (20-200 mg) can produce a sense of well-being and happiness, as well as improved alertness, energy, and sociability. When caffeine crosses the placenta, blood flow to the placenta is decreased (Sajadi-Ernazarova & Hamilton, 2023). Caffeine can exacerbate existing psychiatric symptoms and, in higher doses, particularly affects those with bipolar disorder, causing mood swings, anxiety, manic episodes, and psychotic symptoms. Caffeine use is contraindicated for individuals with gastrointestinal difficulties, urinary incontinence, insomnia, and anxiety (Abdoli et al., 2024).

First identified in the DSM-5 in 2013 as a condition for further study, caffeine use disorder was initially defined in an effort to facilitate research regarding the clinical significance of heavy caffeine use (Bodur et al., 2024). This disorder is considered when an individual is unable to decrease their caffeine intake despite adverse physical and psychological effects. When they decrease consumption, they may experience withdrawal symptoms, which may include headache, fatigue, irritability, and difficulty concentrating. Withdrawal symptoms vary in severity but are typically increased in individuals who are accustomed to high daily doses of

caffeine. Those who habitually use small doses of caffeine can also experience caffeine withdrawal. The number of people who experience caffeine withdrawal is unknown (Sajadi-Ernazarova & Hamilton, 2023).

With increased awareness of caffeine use disorder, the public can have a better understanding of the effects of excessive caffeine consumption, and researchers can gain support for investigations that help identify risk factors and long-term health implications of caffeine use disorder.

## Hallucinogens

Hallucinogens, also known as psychedelics or dissociative drugs, are a type of drug that alters an individual's perception of reality and may produce strong feelings ranging from bliss to fear (National Institute on Drug Abuse, 2023). Hallucinogenic substances can be synthetic, but some naturally occur in plants or fungi. When using a hallucinogen, an individual may experience sensations, including visual images, that seem real but are not. They may feel disconnected from their body or environment. Adverse effects can include dilated pupils, increased body temperature, loss of appetite, sleeplessness, flushing, sweating, drowsiness, tremors, tachycardia, hypertension, muscle weakness, nausea, and vomiting. Users may describe an experience using a hallucinogen as a "good trip" when they have a positive experience, or a "bad trip" when they have a negative experience (Cleveland Clinic, 2023c). It is estimated that 0.6-1.7% of the US population experiences hallucinogen use disorder at some point in their lifetime (Jones et al., 2023). In 2020, approximately 7.1 million Americans aged 12 or older reported using hallucinogens (Open RN, 2022).

Hallucinogens can be categorized based on how they interrupt specific neurochemical networks in the brain (Cleveland Clinic, 2023c). Psychedelic drugs are those that interact with the 5-hydroxytryptamine (5-HT)2A receptors, which

are the target receptors for serotonin (National Institute on Drug Abuse, 2023). Serotonin affects sleep, hunger, mood, body temperature, and sensory perception (Cleveland Clinic, 2023c). The effects of psychedelics typically depend on the dose and can include vivid sensations or visions, an altered sense of self, and increased feelings of insightfulness or connection. Psychedelics include psilocybin and LSD. Dissociative drugs include ketamine and PCP, which block the N-methyl-D-aspartate (NMDA) receptors. These receptors affect how the brain transports the neurotransmitter glutamate (National Institute on Drug Abuse, 2023). Glutamate affects emotions, pain perception, learning, memory, and environmental responses (Cleveland Clinic, 2023c). Like psychedelics, dissociative drugs alter perception, but they also typically make individuals feel disconnected from their body and environment. MDMA, ibogaine, and salvia work on multiple brain functions and result in psychedelic or dissociative effects. If these substances are contaminated, the user may have adverse effects not associated with the substance (National Institute on Drug Abuse, 2023).

Hallucinogens are not only used for recreational purposes. For centuries, they have been used in religious and healing rituals (Cleveland Clinic, 2023c). They have also been used to improve well-being and for spiritual and self-exploration. There are even references to the use of psychedelic substances in ancient texts from India and Greece. In recent years, these substances have been studied for potential clinical benefits for medical conditions, including mental health disorders and substance use disorder. Users sometimes report using these substances to improve their mental health or to reduce stress (National Institute on Drug Abuse, 2023).

Various hallucinogens are associated with substance use disorder. LSD is an abbreviated name for lysergic acid diethylamide. It is made from lysergic acid and is one of the most potent psychedelic chemicals. In its natural form, LSD is found in a fungus that grows on rye and other grains. It typically appears clear or white

and is often ingested via blotting paper that has been soaked in the substance. It is also available in tablet and capsule form. When an individual consumes LSD, they may lose touch with reality and often report experiences that are described as mystical. They may report a blending of senses where they can smell sounds or hear colors. The effects of this substance can last for 9-12 hours. While LSD is not considered addictive, repeated use will increase an individual's tolerance, requiring them to ingest larger amounts to experience the same effects (Cleveland Clinic, 2023c).

Peyote is the name of a small, spineless cactus. This plant's main, naturally occurring, psychoactive chemical is mescaline. Mescaline is extracted from the cactus by removing the disk-shaped buttons from the crown of the cactus and drying them. The buttons are then chewed or soaked in water to create a beverage. Masculine can produce hallucinogenic effects in a dose of 0.3-0.5 grams, and the effects of this substance typically last about twelve hours. The peyote extract is bitter, so some people may consume a tea created with the cactus rather than chew on the dried elements. There is also a synthetic form of this substance. Peyote is one of the oldest known psychedelics and was prominently used as a part of Native American culture (Cleveland Clinic, 2023c). There is evidence of the use of peyote in this way as far back as 5,700 BC (National Institute on Drug Abuse, 2023). The effects on an individual vary depending on the person's body type, personality, substance use history, and expectations. An individual may experience vivid mental images, altered perception of space and time, distorted sense of body, and a loss of sense of reality (Cleveland Clinic, 2023c).

Psilocybin is a substance found in certain mushrooms in tropical and subtropical regions of the United States, Mexico, and South America (Cleveland Clinic, 2023c). Psilocybin was initially used by Aztec shamans in healing rituals (National Institute on Drug Abuse, 2023). This hallucinogen is commonly referred to as "magic

mushrooms" or "shrooms". The mushrooms themselves typically contain less than 0.5% psilocybin and trace amounts of psilocin, which is another hallucinogenic psychoactive substance. To prepare psilocybin, the mushroom is often boiled into a beverage, or it can be eaten raw. With a bitter flavor, it has become popular to mask the taste of the substance using chocolate. The effects of psilocybin include heightened sensory awareness, impaired judgment, and can also cause hallucinations, terror, depression, and panic attacks (Cleveland Clinic, 2023c).

PCP is the common term for phenyl cyclohexyl piperidine, sometimes known as phencyclidine. Street names for this substance include "angel dust" and "killer weed". It is used in liquid, powder, tablet, and capsule forms and is typically swallowed, sniffed, injected, or sometimes smoked. PCP is a synthetic substance that was developed in the 1950s as an anesthetic, but was discontinued in 1965 due to serious adverse effects (Cleveland Clinic, 2023c). Symptoms of PCP use include nystagmus, hypertension, tachycardia, diminished response to pain, ataxia, slurred speech, muscle rigidity, seizures, coma, and noise sensitivity (Open RN, 2022). Individuals who use PCP report an out-of-body sensation. After the high dissipates, the individual can become agitated and irrational (Cleveland Clinic, 2023c). Individuals who use hallucinogens can become belligerent, impulsive, and unpredictable. They can have impaired judgment and are more likely to assault someone while using PCP or shortly after its use. PCP is associated with violent behavior towards self and others (Open RN, 2022). High doses of PCP can cause seizures, coma, or death. Fatalities due to PCP use are typically due to suicide because of increased violent and suicidal behavior, or a fatal accident that occurs when they are impaired. PCP interacts with other central nervous system depressants, like alcohol, that can lead to further complications. (Cleveland Clinic, 2023c).

Ketamine is an FDA-approved anesthetic used in healthcare settings for surgery on both humans and animals. It is available in powder and pill form, but intravenous

use is possible with the liquid form. When used illegally, this substance is typically stolen from veterinary clinics. Ketamine causes an out-of-body feeling that can be pleasant for some and traumatic for others (Cleveland Clinic, 2023c).

Salvia, the common term for *Salvia divinorum*, is a plant found in southern Mexico and Central and South America. It is also known as “the sage of the seers” and “the diviner’s sage”. The leaves of the plant can be chewed, or the juice may be extracted from the plant and ingested. The dried leaves of this plant may be smoked or vaporized for inhalation. Salvia leads to visions, hallucinations, blending of senses, and a feeling of floating above the ground or traveling through time (Cleveland Clinic, 2023c).

Ibogaine is a naturally occurring substance from the iboga tree, a rainforest shrub in Central Africa. Ibogaine is found in the bark of the root, which is crushed and administered in a powder or extract. Iboga has been used for medicinal and ritual purposes in Gabon, Cameroon, and the Republic of Congo. This substance was exploited as a stimulant in the 19th century but has recently been studied as a potential treatment for opioid use disorders, traumatic brain injuries, and post-traumatic stress disorder. Ibogaine is illegal in the United States and can cause fatal cardiac arrhythmias. Ibogaine is not typically used recreationally due to its long duration of action and lucid waking experiences, where individuals are often confronted with disturbing visions of their past (Jacobs, 2024).

Dimethyltryptamine, also known as DMT, is a naturally occurring chemical found in plants located in the Amazon region of South America. This substance is often found in a tea called Ayahuasca, also called hoasca, aya, or yage. In a synthetic form, DMT is a white powder that is smoked (Cleveland Clinic, 2023c). DMT is structurally similar to psilocybin and is known to create short-acting and intense visual hallucinations. DMT is most commonly used in Australia, and individuals describe a feeling of a ‘rush’, happiness, positive mood changes, and increased

sensitivity to sensations. Individuals who use DMT may exhibit tachycardia, constricted pupils, anxiety, confusion, and dissociation. Typically, DMT is associated with a low risk of dependence (Alcohol and Drug Foundation, 2025).

Dextromethorphan is found in over-the-counter cough suppressants and is sometimes used recreationally due to its hallucinogenic and dissociative effects when consumed in large quantities. There are approximately 6,000 hospital visits each year attributed to the recreational use of dextromethorphan, often combined with alcohol use. Symptoms of toxicity include hallucinations, inappropriate laughing, psychosis with dissociative features, agitation, coma, tachycardia, dilated pupils, diaphoresis, and an ataxic gait. Since acetaminophen is often included in products containing dextromethorphan, nurses should be aware that there may be liver injury associated with non-medical use (Open RN, 2022).

Some consider MDMA, typically categorized as a stimulant, to have psychedelic properties (National Institute on Drug Abuse, 2023). Also known as “ecstasy” or “molly”, this amphetamine derivative can cause feelings of increased social connection, euphoria, and increased energy levels (Jones et al., 2023). MDMA blocks monoamine transporters and enhances both dopamine and serotonin. It is considered a mixed drug because it produces both the effects of stimulants and hallucinogens (Volkow & Blanco, 2023). Cannabis, also known as weed, is considered a hallucinogen, even though it does not always cause hallucinogenic effects in the person using the substance, especially at lower doses (Cleveland Clinic, 2023c).

With continued use, individuals may experience long-term health problems associated with hallucinogens. The long-term use of ketamine can cause ketamine-induced uropathy, which causes symptoms similar to a urinary tract infection. MDMA use may be associated with mild to moderate heart valve disease. Ibogaine has been associated with long QT syndrome, causing irregular

heartbeats. Long-term dissociative drug use has been associated with worsening symptoms of schizophrenia and short-term episodes of psychosis, where the individual has difficulty determining what is reality and what is not. This psychosis can persist for days to weeks. Research on the effects of long-term PCP and ketamine use in animals has been found to cause brain changes resembling those seen in people with schizophrenia. (National Institute on Drug Abuse, 2023)

Though psychedelic drugs are not typically considered to be addictive, there is a mild association with some substances and weakly reinforced use. Studies do suggest, however, that ketamine used outside of healthcare settings can lead to substance use disorder, including cravings and withdrawal symptoms (National Institute on Drug Abuse, 2023). PCP is most highly associated with hallucinogen use disorder (Jones et al., 2023). LSD and mescaline were also associated with hallucinogen use disorder. Research continues to determine the potential mechanisms associated with hallucinogenic use disorder (Jones et al., 2023). Even in substances that are not highly addictive, tolerance is developed quickly, and individuals begin to require more of the substance to experience the same level of effects (National Institute on Drug Abuse, 2023).

## Inhalants

Inhalant is a broad term that refers to various volatile substances, including volatile solvents, gases, aerosols, and nitrites (Radparvar, 2023). Inhalant use disorder occurs when an individual inhales common household and workplace products to produce desired psychoactive effects (Cleveland Clinic, 2024c). These products include oven cleaner, model glue, spray paint, paint thinner, cleaning fluid, nail polish remover, gasoline, lighter fluid, and more than 1,000 other products that can be inhaled to produce a “high”. The use of inhalants is strongly associated with the intense stimulation of the reinforcement and reward network of the brain, contributing to compulsive use (Cleveland Clinic, 2024c). Symptoms

of inhalant intoxication include belligerence, aggression, apathy, impaired judgment, dizziness, nystagmus, incoordination, slurred speech, unsteady gait, lethargy, depressed reflexes, psychomotor retardation, tremors, muscle weakness, vision changes, stupor, coma, and euphoria (Open RN, 2022)

There are four primary categories of inhalants: volatile solvents, anesthetic gases, nitrous oxide, and volatile alkyl nitrites. Each category has distinct mechanisms of action and associated toxicities. Volatile solvents and anesthetic gases include products such as lighter fluid, bottled fuel, hair spray, spray paint, room fresheners, cooking oil spray, adhesive, gasoline, industrial solvents, rubber cement, shoe polish, glue, paint thinner, nail polish remover, degreaser, cleaning solutions, topical anesthetics, general anesthetics, and others. Nitrous oxide, an inorganic anesthetic gas, is found in canned whipped cream, balloon tanks, and is commonly used as an inhaled anesthetic in dental settings. Volatile alkyl nitrites include vasodilators for clinical angina and room deodorizers (Radparvar, 2023).

Inhalants categorized as volatile solvents are rapidly absorbed once inhaled and quickly cross the blood-brain barrier, producing immediate, though brief, euphoric effects. Peak concentration occurs within minutes. These substances are central nervous system depressants, though they do initially produce excitatory effects by triggering the release of epinephrine and activation of the dopamine reward system. After the excitatory phase, CNS depression occurs. These substances are particularly damaging to dopamine neurons of the ventral tegmental area and medial prefrontal cortex, affecting behavior and reward-based decision making. Research continues to better understand the mechanism of action of these substances. Metabolism occurs in the liver and is rapid. Users can experience acute toxicity with their first use, leading to sudden sniffing death syndrome. The most common cause of sudden death due to inhalants is believed to be a catecholamine release commonly found with the use of hydrocarbons, such as gasoline. The release of catecholamine can trigger supraventricular or ventricular

tachyarrhythmias. Another cause of sudden sniffing death syndrome occurs through the sudden cooling of the airway by inhalants like freon. When inhaled, this substance can trigger an intense and fatal vagal nerve reflex response and bradycardia, which may lead to asystole or secondary ventricular arrhythmias. Acute hypoxemia may also lead to sudden death in an individual inhaling a volatile solvent. Accidental flash fires are also a cause of injury or death due to inhalant use. (Radparvar, 2023)

Nitrous oxide, commonly called “laughing gas,” is a dissociative anesthetic. Individuals who misuse nitrous oxide are typically either those who have professional access to this substance, such as dentists, or are teenagers. Outside of the healthcare setting, this substance is used as a propellant in aerosol cans and is often used in canned whipped cream. Nitrous oxide is also found in products that increase vehicle engine performance. Nitrous oxide has anesthetic and opioid analgesic effects, is rapidly absorbed through the alveoli in the lungs, and is eliminated in this way within five minutes of inhalation. When inhaled, nitrous oxide may cause the individual to experience feelings of dissociation, numbness, warmth, and disorganized thinking. Sensory processes are depressed, and drowsiness and mood alterations are common. Individuals may experience dysphoria, inappropriate behaviors, laughing, or crying. Use of nitrous oxide increases vascular resistance in the liver and kidneys. It can also induce the vomiting reflex due to chemoreceptor activation in the medulla (Radparvar, 2023).

An estimated 2.4 million people over age 12 in the United States report using an inhalant in the past year (Cleveland Clinic, 2024c). The use of inhalants is highest among adolescents (Open RN, 2022). This type of substance use disorder is a global problem, primarily affecting impoverished or marginalized cultural groups, though it is often an overlooked form of substance use disorder. Healthcare workers are often unfamiliar with the signs and symptoms of inhalant use. Since the route of administration of these substances is non-invasive and the substances

themselves are easy to obtain legally, many believe inhalants carry little risk and do not understand the severity of the adverse effects of inhalant use (Radparvar, 2023).

Volatile alkyl nitrites were initially developed to treat angina but are no longer commonly used due to the development of longer-acting agents. These substances were originally packaged in glass vials, which had to be broken to access the substance, giving this inhalant the street name “popper”. These substances are commonly available online and in adult novelty stores. The effects are immediate and may last up to five minutes. Once absorbed, nitrites produce vasodilation in the cranial and peripheral vasculature. This may produce symptoms of headache, light-headedness, euphoria, flushing, tachycardia, visual distortions, slowed perception of time, syncope, excitement, or euphoria. These substances are rapidly metabolized in the liver and excreted in the urine. Nitrites are typically not used for euphoric effects but are most commonly used to enhance sexual experiences. Due to vasodilation, the use of nitrites increases the risk of sexually transmitted infections. Acute use can lead to cardiopulmonary symptoms and central nervous system effects (Radparvar, 2023).

Symptoms of inhalant use may vary, but some signs of use are chemical odors on the breath or clothes and paint or other stains on hands, fingers, or clothes. Individuals may also exhibit changes in behavior, apathy, decreased appetite, weight loss, abrupt changes in social involvement, rapid decline in academic performance and hygiene practices, slurred speech, rhinorrhea, nosebleeds, fatigue, or ulcers. They may also experience confusion, poor concentration, depression, irritability, hostility, and paranoia (Cleveland Clinic, 2024c).

Inhalants cause multi-system organ damage, affecting pulmonary, cardiac, dermatologic, renal, hematologic, gastrointestinal, hepatic, and neurologic systems. With long-term use, inhalants can lead to psychiatric, cognitive,

behavioral, and anatomical adverse effects. Use during pregnancy is associated with fetal abnormalities (Radparvar, 2023). Some commonly inhaled substances are associated with severe or fatal medical complications. Solvents and aerosol sprays have particularly high concentrations of chemicals, and inhaling them can lead to seizures, coma, and sudden cardiac death. These drastic consequences can occur for first-time users in addition to chronic users. Some individuals will place a plastic bag over their head to increase the length of time they can inhale the substance and potentiate the effects of the substance. When this is done, there is a significantly increased risk for the replacement of oxygen with toxic chemicals, leading to death by asphyxiation (Cleveland Clinic, 2024c).

## Opioids

Opioids and opiates are narcotics, which are a class of natural and synthetic chemicals that are used to treat pain, usually after an injury or surgery. However, they are also used to treat chronic pain (Cleveland Clinic, 2022b). Naturally occurring opioids are produced from opium (Mayo Clinic, 2025b). Examples of opioids and opiates used for clinical pain treatment are oxycodone, oxymorphone, morphine, codeine, and fentanyl. Heroin is also an opiate, though it is only used recreationally and is not available legally (Cleveland Clinic, 2022b).

Opioids act on opioid receptors in the central nervous system, which relieves moderate to severe pain (Open RN, 2022). These receptors also help regulate breathing and are involved in stress responses. Opioid receptors are also found in the reward center of the brain. When opioids bind to these receptors, there is reinforcement of the use of opioids. Individuals who use opioids report feelings of pain relief, happiness, and relaxation. They can also affect a person's ability to think, concentrate, and make decisions (National Institute on Drug Abuse, 2024b).

Opioids have a high addiction potential compared to most other drugs due to the triggering of endorphin release. Endorphins are the neurotransmitters responsible for feelings of euphoria. People who use opioids can develop substance use disorder very quickly, sometimes in as little as 4-8 weeks. When used as prescribed, the risk for developing opioid use disorder decreases. However, these substances are highly addictive due to the sense of euphoria some individuals experience when they use opioids. Approximately 3-19% of individuals prescribed opioids will develop opioid use disorder (Cleveland Clinic, 2022b).

Opioid use disorder is considered an epidemic in the United States, affecting over 3 million people. In 2020, 9.5 million Americans aged 12 and older reported using opioids in the past year. It is estimated that 9.3 million people misused prescription pain medications, while 902,000 individuals reported using heroin (Open RN, 2022). Opioid use disorder affects over 20 million people globally, and over 120,000 deaths worldwide are due to opioid use each year (Cleveland Clinic, 2022b).

Fentanyl is an especially dangerous opioid. When fentanyl is illegally manufactured, the substance is typically more addictive and more likely to produce adverse effects. Carfentanil, a potent synthetic opioid, is becoming the new culprit responsible for many opioid overdoses. Clinically, it is used in veterinary medicine to tranquilize large animals, such as elephants. It is known to be approximately 10,000 times more potent than morphine and 100 times more powerful than fentanyl, meaning just 2 mg of the substance can be fatal. Carfentanil can be absorbed into the body unknowingly, as it can be absorbed through the skin or inhaled. For this reason, this substance is also dangerous to healthcare workers when they encounter someone who is experiencing toxicity due to Carfentanil (Open RN, 2022).

Opioid use has long-term effects on the body. Those with chronic pain can experience worse pain symptoms due to the alterations in pain signaling that occur with long-term opioid use (Cleveland Clinic, 2022b). Long-term opioid use can also cause adverse effects, such as constipation, nausea, vomiting, headache, dizziness, fatigue, or other sleep disorders. Opioids also have the potential to cause cardiovascular changes, including bradycardia, hypotension, heart failure, and cardiac arrest. Opioids can impair the immune system and increase the risk of infections. Opioid use has also been associated with sexual dysfunction and mental health disorders such as depression. Individuals who inject opioids are at increased risk for HIV, Hepatitis C, and endocarditis (National Institute on Drug Abuse, 2024b).

Opioid overdose occurs when an individual uses more opioids than their body can tolerate (National Institute on Drug Abuse, 2024b). Symptoms of an opioid overdose include loss of consciousness, pinpoint pupils, slowed and shallow breathing, or symptoms of hypoxia. Individuals may experience respiratory arrest (Open RN, 2022) in extreme cases. During an acute opioid overdose, naloxone is used to reverse the effects of the substance. It is available in multiple forms, though the nasal spray solutions are the easiest and most effective for community members and first responders to use. Naloxone can also be administered intramuscularly (Open RN, 2022).

## Sedatives, Hypnotics, and Anxiolytics

Anxiolytics are medications used to treat clinical panic disorders, generalized anxiety, and other mental health disorders. Sedatives (hypnotics) are medications that are used to treat insomnia and other conditions. They are also used in anesthesia. While these substances have a legitimate place in healthcare, they can also lead to misuse (Simone & Bobrin, 2023). Sedatives, hypnotics, and anxiolytics are categories of substances that are grouped together because they often

overlap and affect the central nervous system in similar ways. These substances may also sometimes be referred to as “depressants” because they significantly slow down brain activity (Collier, 2025). Symptoms of intoxication from sedatives, hypnotics, and anxiolytics are similar to alcohol intoxication, including slurred speech, incoordination, unsteady gait, nystagmus, impaired attention and memory, or stupor (Open RN, 2022). These medications can be grouped into four categories: benzodiazepines, barbiturates, hypnotics (nonbenzodiazepines), and miscellaneous sedatives. It is estimated that more than five million people in the United States misuse sedative substances (Cleveland Clinic, 2023d).

Commonly used since the 1960s, benzodiazepines are well-understood and affect the central nervous system. This drug class triggers the release of gamma-aminobutyric acid (GABA), slowing neuronal activity and producing sedating effects. Benzodiazepines can cause temporary anterograde amnesia, or the inability to create new memories. They also decrease symptoms of anxiety and cause drowsiness. Some benzodiazepines are more potent than others, and they also vary in their duration of action. Typically, more long-acting benzodiazepines are not as potent. Alprazolam (Xanax) and diazepam (Valium) are the most commonly prescribed benzodiazepines (Cleveland Clinic, 2023d), and many other benzodiazepines are available in the United States with a prescription. Flunitrazepam (Rohypnol), often known by its slang term, “roofies”, is illegal in the United States (Cleveland Clinic, 2023a). Benzodiazepines are the most commonly misused anxiolytic and are most common among younger adults (Simone & Bobrin, 2023).

Barbiturates are an older class of drugs and include Amytal, pentobarbital (Nembutal), Seconal, and phenobarbital (Collier, 2025). These medications are typically used in anesthesia, seizure treatment, and insomnia treatment (Cleveland Clinic, 2023d). Recreational use of barbiturates is particularly dangerous because there is a small difference between the dose used to achieve

desired effects and a dose amount that can lead to coma, respiratory distress, and death. The withdrawal from barbiturates can also be fatal due to potential seizures (Collier, 2025).

Hypnotics produce a very similar effect to benzodiazepines, but are not the same substance. Hypnotic medications include eszopiclone (Lunesta), zaleplon (Sonata), and zolpidem (Ambien). They are often used to treat insomnia and sleep disorders (Cleveland Clinic, 2023d).

Miscellaneous sedatives are medications that have similar effects, but are not considered benzodiazepines, barbiturates, or hypnotics. These include amelteon (Rozerem), Suvorexant (Belxomra), and other sedating drugs (Cleveland Clinic, 2023d). Some substances, such as alcohol and opioids, also have sedating effects, but are more appropriately categorized on their own due to their widespread use and addictive potential.

Sedatives vary in potency and duration. When taken, an individual may experience feelings of relaxation, decreased anxiety, and decreased sensory perception. They may experience drowsiness, shallow breathing, bradycardia, decreased muscle function, and memory dysfunction. Some medications, like antihistamines, may have a sedating effect, but it is so mild that they are not considered true sedatives. Long-term use of sedatives can lead to memory dysfunction, depression, suicidal ideation, and liver failure. Symptoms of overdose due to the use of sedatives include profound sedation, slurred speech, ataxia, respiratory depression, and coma. Withdrawal symptoms can include anxiety, loss of appetite, tremors, night terrors, high fever, tachycardia, tachypnea, and seizures (Cleveland Clinic, 2023d).

## Stimulants

Stimulants have the converse effect on the central nervous system compared to sedatives. These substances increase central nervous system activity and include

cocaine, amphetamine, methamphetamine, cathinones, and prescription medications like Adderall and Ritalin. The rate of death due to stimulant overdose has increased in recent years, and more than half of the deaths were also associated with opioid use (VA, 2025). Stimulants flood the brain's reward network with dopamine, which strongly reinforces the use of the substance and dramatically increases the likelihood of addiction. Over time, however, more of the substance is required to elicit the same neurological response. Binging of stimulants is common due to the short half-life of these substances (Open RN, 2022).

When an individual is intoxicated from stimulant use, they may experience behavioral and psychological changes. These may include euphoria, blunted affect, changes in sociability, hypervigilance, interpersonal sensitivity, anxiety, tension, anger, and impaired judgment. Other symptoms may include tachycardia, hypertension, hypotension, hyperthermia, pupillary dilation, diaphoresis, nausea, vomiting, weight loss, agitation, muscular weakness, respiratory depression, chest pain, cardiac dysrhythmias, confusion, seizures, coma, psychosis, hallucinations, dyskinesia, or dystonia (Open RN, 2022).

Amphetamines are prescribed to treat attention-deficit/hyperactivity disorder and other medical conditions, but recreational use has become prevalent in Asia, Australia, and the United States. Illicit amphetamines can be easily produced using common household materials, which increases availability. Amphetamines can be inhaled, intravenously or intramuscularly injected, ingested, or through transmucosal administration. Peak plasma levels and duration vary depending on the route, but the effects can last for days. When misused, the psychosis individuals experience with amphetamine use is similar to behavior observed in schizophrenia (Mullen et al., 2023). MDMA, also known as "ecstasy" or "molly," is not currently approved by the FDA for medical use, but is used recreationally as a

“party drug”. There is current research, however, on the use of this substance to treat post-traumatic stress disorder (Cleveland Clinic, 2025).

There are approximately two million methamphetamine users in the United States (Open RN, 2022). Methamphetamine has an additional methyl group than amphetamine, which allows it to cross the blood-brain barrier more easily. It is also more potent and the effects are longer-lasting than amphetamines. Methamphetamine use has increased in the United States, especially when used alongside opioids. Methamphetamine has also become more potent and more readily available in recent years. Illegal methamphetamine is available in various forms, including liquid, powder, crystalline, and pills. The powder form is often called meth, speed, or crank. Crystal methamphetamine, also known as “crystal”, “ice”, or “tina”, is a more potent form of the drug and is also more easily smoked. Individuals may also use methamphetamine through ingestion, snorting, inhalation, insertion in the rectum, or injection directly into the bloodstream. The half-life of methamphetamine is 9-11 hours, but it varies depending on the route. Intravenous and intranasal use produce a peak effect within 15 minutes. When someone smokes or ingests methamphetamine, the peak effect takes longer. Methamphetamine is excreted in the urine (Cleveland Clinic, 2025).

There are approximately 5.5 million cocaine users over age 12 in the United States, with 778,000 reporting the use of crack, the crystalline form of cocaine (Open RN, 2022). Cocaine is a naturally occurring substance extracted from the *Erythroxylum coca* plant, originally from South America. The powder form of cocaine, also known as “coke”, “blow”, “snow”, and other street names, can be taken intranasally or intravenously. The bicarbonate form is known as “crack” and is typically smoked or inhaled. Inhaled cocaine produces effects very quickly, within 3-5 seconds, but leads to a rapid cycle of use due to a short duration of action. The half-life of cocaine is 0.7-1.5 hours and is rapidly metabolized by the liver and then excreted in the urine (Ciccarone & Shoptaw, 2022).

Cathinones, similar to amphetamines, can be naturally derived from the khat plant (*Catha edulis*), native to East Africa and the Arabian Peninsula. They can also be synthetically derived. While parts of the khat plant are often chewed to achieve psychoactive effects, synthetic cathinones are typically ingested in pill or capsule form or occasionally smoked, inhaled, or injected intravenously. The onset and duration of action vary widely. This substance is becoming more commonly used in the United States (Ciccarone & Shoptaw, 2022).

When misused, stimulants can have multiple effects on the body. These may include tachycardia, dilated pupils, hypertension, sweating, chills, nausea, vomiting, and chest pain. These substances can lead to heart attack, stroke, severe weight loss, dental problems, violent behavior, psychosis, paranoia, anxiety, confusion, decreased productivity, and death (VA, 2025). Withdrawal symptoms include insomnia, trouble concentrating, fatigue, irritability, anxiety, agitation, sadness, depression, and decline in functional ability (Ciccarone & Shoptaw, 2022)

## Cannabis

Cannabis, also known as marijuana, weed, or pot, refers to all products extracted from the plant *Cannabis sativa*. The dried flowers, leaves, stems, and seeds contain over 500 chemical substances, including cannabidiol (CBD). Marijuana is the term used for the parts of the plant that contain tetrahydrocannabinol (THC). THC is the chemical attributed to the psychoactive effects of cannabis. THC triggers a surge of dopamine in the brain, driving the continued use of this substance. Those who experience cannabis use disorder typically use the THC-containing form of cannabis (Cleveland Clinic, 2024b). Though marijuana has been legalized in many states for medical and/or recreational use, it has not been approved for medical use by the US Food and Drug Administration. There are THC-based oral medications, however, that are approved by the FDA for the treatment

of nausea in patients with cancer and to stimulate appetite for those with wasting syndrome due to AIDS (Open RN, 2022).

Cannabis is available in multiple forms. Oils and concentrates can be vaped or inhaled. Inhaling high concentrations of these oils or extracts, known as wax or shatter, is commonly called dabbing. Due to the rapid absorption of THC using this method, there is an increased risk of adverse effects. When cannabis is mixed into foods, such as candies, gummies, and drinks, they are referred to as edibles. The onset of effects is typically slower with this method, which may result in an increased amount of THC being ingested, which can increase the likelihood of adverse effects. Cannabis-infused alcohol or oils that are consumed in small amounts are called tinctures. THC can also be found in lotions and balms applied directly to the skin. Most individuals with cannabis use disorder smoke cannabis (Substance Abuse and Mental Health Services Administration, 2024). Cannabis is commonly considered a “gateway” drug because it is very often one of the first psychoactive substances an individual will use, along with alcohol and tobacco. Though cannabis is a gateway drug, most individuals who use cannabis do not use other substances in their lifetime. The use of cannabis, however, can increase the likelihood of addiction to other substances if they are used (National Institute on Drug Abuse, 2024a).

Cannabis is the most commonly used federally illegal drug in the United States (CDC, 2024a), despite it being legally available in many states. In 2023, there were an estimated 43.6 million users. It is estimated that 15.8 million people in the US in 2023 vaped marijuana. (Substance Abuse and Mental Health Services Administration, 2024). Cannabis use disorder is experienced by a subset of this group, with 16.3 million people aged 12 and older in the US  in 2021 experiencing cannabis use disorder in the previous twelve months (Cleveland Clinic, 2024b).

It is estimated that 3 in 10 cannabis users experience cannabis use disorder. Like other substance use disorders, some individuals find they need to use more cannabis over time to achieve the desired psychoactive effects (CDC, 2024c). Symptoms of cannabis use disorder include confusion, memory problems, learning difficulties, hallucinations, and delusions. Long-term use of cannabis can lead to psychosis, anxiety disorder, sleep disorder, cannabis hyperemesis syndrome, chronic bronchitis, and fertility issues (Cleveland Clinic, 2024b). Cannabinoid hyperemesis syndrome occurs when someone experiences nausea, vomiting, and abdominal pain after heavy cannabis use (National Institute on Drug Abuse, 2024a). When adolescents experience cannabis use disorder, they are more likely to experience severe marijuana addiction, altered brain development, cognitive impairment, poor educational outcomes, and lower IQ (Cleveland Clinic, 2024b). There is an increased risk of head, neck, and throat cancers for those who smoke cannabis (National Institute on Drug Abuse, 2024a). Fatal overdose due to the use of cannabis alone is not likely, but the use of cannabis can lead to unintentional injury or death (Open RN, 2022).

In recent years, the concentration of delta-9 THC (the primary form of THC found in marijuana plants) has increased drastically. THC-containing products found at legal, non-medical dispensaries can have up to 45% THC concentration. The concentration can also vary according to the form of cannabis. Research continues in an effort to determine the effects of high concentrations of THC on the brain and body. However, it is believed that higher concentrations increase the risk for cannabis use disorder (CDC, 2024c). Delta-8 THC is not FDA approved for medical use, and ingestion of large amounts of this cannabinoid has been known to cause dyspnea and other medical emergencies. Synthetic cannabinoids, commonly called Spice or K2, can have significant adverse effects on the user due to a higher concentration of THC (National Institute on Drug Abuse, 2024a).

Individuals can experience withdrawal symptoms if they have used heavy amounts of cannabis, even if they do not meet criteria for cannabis use disorder. Individuals in withdrawal may have symptoms of anger, irritability, depression, insomnia, disturbing dreams, headaches, sweating, abdominal pain, and tremors (National Institute on Drug Abuse, 2024a).

## Tobacco

Tobacco use is the most prevalent substance use disorder, with an estimated 20% of individuals reporting they experienced nicotine use disorder within the previous year (Volkow & Blanco, 2023). Globally, over a billion individuals use tobacco, and while the use of tobacco is legal in most countries, people often underestimate the addictive potential of this substance. Tobacco use disorder is the primary cause of preventable deaths in the Western world (Leone & Evers-Casey, 2022). Tobacco is available in different forms, like cigarettes, cigars, dip, and e-cigarettes. Any of these nicotine-containing substances can be addictive and lead to tobacco use disorder. The difference between nicotine dependence and substance use disorder is that nicotine dependence occurs when an individual's body becomes accustomed to the effects of nicotine. Tobacco use disorder occurs when the individual needs to use nicotine to avoid withdrawal symptoms. These withdrawal symptoms include feeling anxious, restless, fatigued, apathetic, inattentive, or depressed. Some individuals may feel tightness in their chest, insomnia, dizziness, gastrointestinal upset, headaches, increased appetite, rhinorrhea, coughing, dry mouth, throat irritation, and nausea. Typically, individuals will begin to experience withdrawal symptoms within a few hours of their last tobacco use, and these symptoms typically peak on the second or third day after their last use (Cleveland Clinic, 2022a).

Tobacco is a plant belonging to the genus *Nicotiana*, which is a member of the nightshade family. Originally from Central and South America, *Nicotiana tabacum*

*L.* is known to contain high concentrations of nicotine, which can be inhaled. This substance was commonly used in religious and cultural ceremonies in the ancient civilizations of the Americas. Traditionally, it was smoked in cigars or pipes, or chewed with lime, producing stimulating, then emetic and hallucinatory effects. The recreational use of tobacco was spread by European explorers in the 16th century, with Jean Nicot, the French ambassador to Portugal, introducing the substance to the French royal family. The plant's genus and principal active salt, nicotine, were named after Nicot, and its use spread globally. Tobacco use disorder in the United States emerged during the Industrial Revolution. With the invention of the automated cigarette rolling machine and the decline of social acceptance of chewing tobacco, the price of cigarettes dropped drastically. Changes to tobacco farming techniques in the 19th century made the tobacco more potent and more enjoyable to smoke, which in turn, became more easily addictive (Leone & Evers-Casey, 2022).

Nicotine, a stimulant, is not the only component of tobacco that has reinforcing properties, but it is the most pharmacologically active component. Nicotine increases feelings of wakefulness and exhilaration while also triggering a dopamine response (Cleveland Clinic, 2022a). Tobacco producers worked to make nicotine more easily absorbed into the bloodstream through inhalation, which also contributed to the emergence of tobacco use disorder. Nicotine stimulates nicotinic cholinergic receptors, directly and indirectly affecting multiple neurotransmitters involved in the neurological reward system, as well as affecting the stress response regulation of the hypothalamic-pituitary-adrenal axis (Leone & Evers-Casey, 2022).

## Polysubstance

An individual can experience one substance use disorder or multiple substance use disorders, known as polysubstance use disorder. In situations of polysubstance

use disorder, the substances are used either at the same time or within a short period (Cleveland Clinic, 2024d). Polysubstance use is common, regardless of the legal status of a substance. Individuals who use tobacco are more likely to use alcohol than non-tobacco users. Cannabis users are more likely to use opioids than those who do not use cannabis recreationally. It is not clear why people practice polysubstance use, but it is believed it is often due to a progression of substance use (Compton et al., 2021). Polysubstance use disorder is particularly dangerous because the effects on the body can be unpredictable and potentially life-threatening. Prescribed medications, even when taken appropriately, that are accompanied by misuse of a different substance can also be considered polysubstance use disorder due to the unpredictable effects the medication and misused substance may have on the body when taken together (Cleveland Clinic, 2024d).

The prevalence of stimulant use along with opioids has become more common, with up to 25% of opioid users claiming they experience at least two other substance use disorders in addition to their opioid use. Recently, there has been increased evidence of methamphetamine use among adults admitted to treatment programs for heroin use (Compton et al., 2021).Typically, an individual may start using a stimulant with an opioid when they have developed opioid use disorder and no longer achieve the desired psychoactive effects with the opioid alone. A “speedball” refers to cocaine consumed along with heroin. The combination of methamphetamine and heroin or fentanyl is known as a “goofball” but is not as commonly used. It is believed that these forms of polysubstance use are contributing to an increase in overdose deaths (Ciccarone & Shoptaw, 2022).

In addition to intentional polysubstance use, the use of multiple substances can also be unintentional when illegal drugs are mixed or cut with other substances. Fentanyl can be mixed into drugs without someone’s knowledge and is particularly dangerous. Some individuals may believe that stimulants and depressants balance

the effects of each other, but in reality, it makes the effects unpredictable and can mask dangerous symptoms. Someone may not realize they have used more than they intended and experience an overdose. Using alcohol with other psychoactive substances can also increase the risk of overdose (Prevention, 2024b). When barbiturates are used with alcohol to increase the feelings of intoxication, the individual may experience fatal respiratory depression (Simone & Bobrin, 2023)

### Section 4 Personal Reflection

What types of substance use disorders have you encountered in your practice? What are some similarities between the different types of substance use disorder? What are the differences? Why is polysubstance use disorder particularly dangerous?



## Section 5: Risk Factors

Substance use disorder affects individuals of all ages, races, sexes, genders, and socioeconomic levels. However, some individuals are at increased risk for substance use disorder (Cleveland Clinic, 2024e), and some factors can increase the rate at which someone develops a substance use disorder (Mayo Clinic, 2025b). These risk factors include developmental, environmental, social, and biological influences. Co-occurring mental health disorders can also contribute to substance use disorder. Some conditions are protective against developing a substance use disorder (Open RN, 2022).

### Developmental Factors

Brain development affects the risk for substance use disorder. The prefrontal cortex does not fully develop until the mid-twenties (Volkow & Blanco, 2023). As a result, adolescents and young adults are at increased risk for substance use

disorder (Mayo Clinic, 2025b). Experimentation and risk-taking are typical characteristics of adolescent development. For some individuals, that experimentation includes substance use (Open RN, 2022). Peer pressure is a strong factor during this time, and adolescents who lack parental supervision are at increased risk. Substance use can alter the brain's development and increase the likelihood of substance use disorder (Mayo Clinic, 2025b).

It is estimated that almost 2/3 of 18 to 30-year-olds admitted to a treatment program for substance use disorder began using substances when they were 17 years old or younger. Evidence shows that the younger an individual is when they begin to use substances, the more likely they are to develop a substance use disorder (Open RN, 2022). Individuals who begin using cannabis before age 18 are four to seven times more likely to develop cannabis use disorder (Cleveland Clinic, 2024b). Stressors and adverse childhood events can further delay the maturation of the prefrontal cortex, which increases the risk of developing a substance use disorder. (Volkow & Blanco, 2023)

When there is exposure to substances in utero or postnatally, there is a higher vulnerability to develop a substance use disorder later in life. This is due to the modification of gene expression that occurs during these early stages of development. The earlier exposure occurs, the more likely the effects on the development of the brain will be long-lasting. Some risk factors related to early exposure may not necessarily depend on the intensity of the exposure, but rather on the timing of the exposure. There is ongoing research to study how early adverse childhood events modify brain development and increase risk for substance use disorders (Volkow & Blanco, 2023).

## Environmental/Social Factors

The social environment has a greater impact on children and adolescents during periods of rapid brain development. Environments that include high levels of stressors, poor social support, easy access to drugs, and a lack of opportunities increase the risk for substance use disorder. (Volkow & Blanco, 2023). Other environmental factors that increase the risk of substance use disorder include social dynamics, finances, and cultural norms. Adverse childhood experiences are stressors that occur early in life and can impact an individual's life trajectory. Examples include physical, emotional, or sexual abuse, neglect, poverty, and household instability. Instability in the household can include factors such as parental substance use, elevated conflict, mental illness, and parental incarceration (Open RN, 2022). Individuals who do not have a close relationship with immediate family members are also at increased risk for substance use disorder (Mayo Clinic, 2025b).

In communities where the cost of alcohol is low, substance use becomes more accessible. The high availability of substances, such as the presence of many liquor stores in a small geographical area, increases risk. Individuals who experience unemployment, racism, and discrimination are at increased risk for developing a substance use disorder and may experience more severe addiction. Those who experience natural disasters or political conflict, like war, also have increased social risk factors. Community norms and attitudes may be favorable to substance misuse and consider alcohol or drug use normal for youth. Communities that are densely populated, lack public gathering areas, show physical deterioration, and have high rates of adult crime are at increased risk of developing substance use disorder. Socioeconomic status is measured using a combination of education, income, and occupation levels. Individuals who live in a low socioeconomic community are at increased risk for substance use disorder. Communities with

high rates of mobility, such as individuals moving in and out of the area frequently, also present an increased risk for substance use disorder (Open RN, 2022).

Individuals who are involved in the judicial system are more likely to have a substance use disorder. More than half of the individuals who are incarcerated have a substance use disorder, and substance use and misuse continue in jails and prisons. These individuals are at increased risk for HIV due to the use of contaminated needles in prison (Volkow & Blanco, 2023).

## Biological Factors

Biological risk factors are those that are inherited, due to developmental exposure, or are the result of a co-occurring condition. It is estimated that genetics accounts for 50% of total addiction risk (Volkow & Blanco, 2023). Individuals who have a close genetic link to someone with a substance use disorder are at increased risk for developing the disorder themselves (Mayo Clinic, 2025b). Multiple gene variants can influence the development of substance use disorder. These include the genes that code for substance metabolism, dopaminergic and glutaminergic neurotransmission intensity, neuroplasticity, and brain development. Some genes can increase a person's susceptibility to opioid or nicotine dependence. Variations in the prefrontal cortex development can also affect risk. Individuals may have personality traits that increase their likelihood of substance misuse. They may have metabolic pathways that process substances more slowly or quickly than others. Research has found that multiple genetic variants influence substance use disorders, but the ability to predict substance use disorder based on genetic factors remains poor (Volkow & Blanco, 2023).

Individuals assigned male sex at birth are at higher risk for substance use disorders. Biological males typically consume more alcohol than biological females. Interestingly, biological females typically progress to a substance use

disorder more quickly than biological males. Biological females also tend to experience more intense withdrawal symptoms from some substances (Open RN, 2022). Individuals from sexual and gender minorities are more likely to experience substance use disorder (Volkow & Blanco, 2023).

Race and ethnicity can impact an individual's risk for developing a substance use disorder due to biological factors. In a study that used functional magnetic resonance imaging (fMRI) to evaluate prefrontal cortex activation, it was found that African American smokers had greater activation of the prefrontal cortex than White smokers when presented with cues related to smoking. This difference also accounts for lower smoking-cessation rates among African Americans (Open RN, 2022).

Co-occurring mental health disorders are a biological risk for substance use disorders. It is estimated that 7-10 million people in the United States have both a substance use disorder and another psychiatric disorder (Alhammad et al., 2022). Psychiatric disorders, including mood, anxiety, psychotic, and personality disorders, and ADHD, are all associated with increased risk for developing a substance use disorder. One study found that the risk of substance use disorder almost doubles for individuals who have another psychiatric diagnosis (Volkow & Blanco, 2023). Typically, the mental health disorder is diagnosed at a younger age, and substance use follows (Alhammad et al., 2022). The association between substance use disorders and other mental health disorders is bidirectional. This means that having a mental health disorder can increase the risk of developing a substance use disorder, and having a substance use disorder can contribute to the onset of mental health disorders (Volkow & Blanco, 2023). When substance use occurs in the presence of a pre-existing mental health disorder, symptoms can be exacerbated, and greater functional impairment can occur. This contributes to worsening outcomes, including increased morbidity and mortality, increased

healthcare spending, and higher rates of incarceration, homelessness, and suicide (Open RN, 2022).

It is unclear why substance use disorder and other mental health disorders often co-occur (Open RN, 2022). An individual may initially use a substance to cope with adverse mental health symptoms, but substances often worsen mental health disorders (Mayo Clinic, 2025b). Substance use may trigger a mental health disorder that may not have developed if there had never been substance use by the individual. It is theorized, for example, that individuals who use alcohol are at increased risk for experiencing post-traumatic stress disorder because alcohol negatively impacts the brain's ability to recover from traumatic experiences. Another possible reason for the co-occurrence of substance use disorder and other mental health disorders is that they share common risk factors, including genetics, neurobiology, and adverse childhood events. It can be challenging to distinguish substance use disorder from other mental health disorders at times. For example, symptoms of long-term methamphetamine use are similar to symptoms of a person experiencing schizophrenia (Open RN, 2022).

## Substance-Specific Risk Factors

Some risk factors for substance use are unique to particular substances. Inhalant use is most common among adolescents ages 12-17, but studies have found children as young as five years old who have used inhalants. Inhalants are commonly used in this population because they are inexpensive and easy to obtain. Inhalants are often a gateway drug, which leads to the use of other substances. Therefore, the use of inhalants also increases the risk for other substance use disorders (Cleveland Clinic, 2024c).

Individuals who are legitimately prescribed opioids are at increased risk of developing an opioid use disorder. When they are no longer able to access

legitimate opioids through a prescription, they may turn to heroin, which is more easily obtained but presents a higher risk associated with use (Cleveland Clinic, 2022b). The use of alcohol and tobacco increases the risk of cannabis use disorder. A diagnosis of depression also increases risk for cannabis use (Cleveland Clinic, 2024b). Some substances, like stimulants or opioids, are more likely to contribute to substance use disorder more quickly than the use of other substances. The method of use is also a factor when considering the likelihood of developing a substance use disorder. Substances that are injected or inhaled are more likely to lead to an addiction (Mayo Clinic, 2025b). Undergoing bariatric surgery is a risk factor for developing alcohol use disorder (Mayo Clinic, 2022).

## Protective Factors

Like risk factors, protective factors can be developmental, biological, social, or environmental. Individual personality traits can be a protective factor against developing substance use disorder. Adolescents who have an optimistic outlook are less likely to develop substance use disorder. Among youth who report having an opioid use disorder, those who have higher levels of mindfulness are less likely to progress to intravenous drug use. Individuals with social phobias are less likely to engage in marijuana use. Those with a strong desire for a healthy lifestyle and a negative attitude toward substance use are at decreased risk for developing substance use disorder (Nawi et al., 2021).

Research has found that adolescents with protective and informed fathers were less likely to engage in substance use. Strong religious beliefs integrated into a community culture are very effective protective factors. School connectedness and adult support systems were also protective factors for adolescents (Nawi et al., 2021).

Protective factors can be biological. Research has found that approximately 36% of East Asian people have a genetic variant that impacts the rate of alcohol metabolism. This causes adverse effects when using alcohol, including flushing, nausea, and tachycardia. This can be a protective factor against alcohol use disorder among East Asians, but those who misuse alcohol despite these symptoms are at increased risk for head and neck cancers (Open RN, 2022).

Just as risk factors for substance use disorder are not predictive of developing substance use disorder, protective factors do not eliminate the possibility of substance use disorder.

### Section 5 Personal Reflection

How are developmental, biological, and environmental risk factors interrelated? How do they influence each other and influence substance misuse? Why are risk factors not a guarantee of developing substance use disorder? What are protective factors? Why are these factors not a guarantee that someone will not experience a substance use disorder?



## Section 6: Signs and Symptoms

The physical and psychological signs and symptoms of the misuse of various substances have been presented, but what are the signs that an individual is experiencing some type of substance use disorder? Nurses should be aware of the behavioral and mood changes that indicate an individual is experiencing substance use disorder.

According to the DSM-5, these signs include:

- Using the substance in larger amounts and for a longer period than intended

- Having a strong desire or urge to use the substance
- Having unsuccessful efforts to decrease or stop substance use
- Spending significant amounts of time obtaining, using, or recovering from substance use
- Difficulty fulfilling responsibilities at work, school, or home due to substance use
- Continuing to use the substance even when it interferes with relationships
- Giving up social, occupational, or recreational activities because of substance use
- Continuing to use the substance, even when the individual is aware of the danger
- Continuing to use the substance despite ongoing physical and psychological problems that are likely caused or worsened by the substance
- Requiring more of the substance to achieve the desired effect
- Experiencing withdrawal symptoms

  (Cleveland Clinic, 2024e)

Other symptoms may include the individual reporting that they feel the urge to use the substance daily or multiple times per day, they have urges for the substance that do not allow them to focus on anything else, they prioritize obtaining the substance so they do not run out of their supply, and they spend money on the substance even if they cannot afford it. They may also report participating in actions they would typically never consider in order to be able to obtain the substance, such as theft or driving while using the substance (Mayo Clinic, 2025b).

Family members may have difficulty identifying substance use, especially among adolescents, who typically experience mood changes as a part of puberty. Family members may report problems at school or work, where the individual has frequent absences, is suddenly disinterested, or has a decline in performance. They may report that the individual seems to lack energy and motivation or that weight changes have occurred. They may report that the individual has neglected their appearance when they used to have more interest in their clothing, grooming, or looks. Family members may also report the individual becoming more secretive and barring others from entering their room. They may display drastic changes in their behavior and relationships with family and friends. They may also begin to ask for money without a reasonable explanation. Family members may report that money or items have been stolen from the home (Mayo Clinic, 2025b).

Sometimes symptoms of substance use disorder do not emerge until there has been an abrupt change in the person's routine, like a hospitalization. It is estimated that alcohol use disorder may be as prevalent as 40% of hospitalized patients. Approximately half of those will experience withdrawal symptoms during their admission. Early symptoms of alcohol withdrawal include anxiety, agitation, restlessness, insomnia, tremors, diaphoresis, palpitations, headache, and alcohol cravings. Individuals experiencing withdrawal may also have diarrhea, nausea, vomiting, and loss of appetite. They also may exhibit tachycardia, systolic hypertension, and hyperactive reflexes. Alcohol withdrawal symptoms typically begin 6-36 hours after the individual's last drink and usually last 1-2 days. Severe alcohol withdrawal symptoms can last up to six days and can include hallucinations, seizures, and delirium tremens (DTs). DTs are described as a rapid onset, fluctuating cognitive disturbance that may or may not be accompanied by hallucinations. DTs can also involve autonomic hyperactivity, including fever, severe tachycardia, hypertension, and severe diaphoresis. DTs can be fatal, so

clinical management is necessary to monitor and treat these symptoms. Nurses should be aware of the signs of substance use withdrawal as they may help to identify those with substance use disorder and prevent medical complications due to adverse symptoms (Open RN, 2022).

### Section 6 Personal Reflection

Even though the signs and symptoms of various substance use disorders can differ, why are the general signs and symptoms of substance use disorder similar? Why is it often difficult for family members to identify the presence of a substance disorder in an individual, especially adolescents? How can abrupt changes in an individual's routine affect withdrawal symptoms? As a nurse, how can you respond to an individual who begins experiencing withdrawal symptoms when they are hospitalized for non-substance-related reasons?

## Section 7: Treatments

Treatment of substance use disorders is similar to that of other chronic illnesses. Like hypertension, diabetes, and asthma, substance use disorders require chronic care management, recovery support services, and social services involvement. Many effective strategies can be used to identify, treat, and manage substance use disorders (Open RN, 2022). Nurses can aid in the identification of individuals experiencing substance use disorders through clinical interviews and screening (Xu & Liu, 2023). Like other illnesses, early intervention is the most helpful way to prevent mild substance misuse from progressing into severe substance use disorder and addiction. Medications, behavioral therapies, and supportive services are also integral (Open RN, 2022).

## Acute Care

In the acute phase of substance intoxication, treatment may be supportive, or interventions may be necessary. The priority of acute intoxication treatment is to ensure the patient is hemodynamically stable and there is a low risk for respiratory failure. Endotracheal intubation may be necessary when the respiratory status is compromised (Simone & Bobrin, 2023). Naloxone (Narcan) may be necessary to treat an acute overdose of opioids (Dydyk et al., 2024). Naloxone temporarily blocks the effects of opioids and can prevent death from overdose (VA, 2025). Benzodiazepine toxicity treatment is typically supportive, but flumazenil may be administered as a nonspecific competitive agonist for benzodiazepine receptors. This medication must be used carefully, however, due to the risk of withdrawal seizures (Simone & Bobrin, 2023)

When inhalants have been used, airway burns may occur in addition to typical intoxication symptoms. Patients may need to be decontaminated, with clothing removed and the body thoroughly washed. Inhalants may contribute to chemical pneumonitis, requiring respiratory support and bronchodilators. Metabolic acidosis may also be present with hydrocarbon inhalation or exposure to methylene chloride. Conventional pulse oximetry may not be reliable in these situations, so arterial blood gases should be obtained. In this situation, oxygen therapy must be supplemented with methylene blue (Radparvar, 2023).

Medical treatment for the effects of hallucinogens is supportive, meaning the patient's symptoms are addressed and interventions relate to those specific symptoms. Patients are typically placed in a low-stimulation environment, and benzodiazepines may be used to alleviate extreme agitation or to prevent seizures (Cleveland Clinic, 2023c). Some users may experience a condition called hallucinogen persisting perception disorder (HPPD), where perceived images, scenes, and related moods that were experienced while using the substance are

experienced repeatedly after use is discontinued. These experiences may be referred to as “flashbacks”. Research is limited on why these episodes occur (National Institute on Drug Abuse, 2023).

## Identification

Early intervention services are most helpful for individuals with mild substance use disorders. These services may be provided in school clinics, primary care offices, and mental health clinics. Individuals who engage in binge drinking, particularly those aged 12-17 years, are a target for early intervention programs because they are at increased risk for substance use disorders. Even brief interactions with doctors, nurses, or teachers in the context of routine medical care can provide valuable information regarding the consequences of risky behaviors and help individuals understand the need to reduce substance use. The first step of early intervention is to screen and identify individuals who are at risk of a substance use disorder. Education should be provided in a neutral, nonjudgmental manner. The education provider should emphasize the importance of reducing substance use and the individual’s ability to achieve a reduction in use. Follow-up care should evaluate the effectiveness of the education and determine if formal treatment is necessary (Open RN, 2022).

The Alcohol Use Disorders Identification Tool (AUDIT) screening tool is often used to identify individuals who misuse alcohol. The tool is self-administered, and users answer the questions on a numerical scale of 0-4, with a score of 0 meaning never and 4 meaning four or more times per week. Questions on this screening tool include:

- How often do you have a drink containing alcohol?
- How many standard drinks containing alcohol do you have on a typical day when drinking?

- How often do you have six or more drinks on one occasion?
- During the past year, how often have you found that you could not stop drinking once you started?
- During the past year, how often have you failed to do what is generally expected of you because of drinking?
- During the past year, how often have you needed a drink in the morning to get yourself going after a heavy drinking session?
- During the past year, how often have you had a feeling of guilt or remorse after drinking?
- During the past year, how often have you been unable to remember what happened the night before because you had been drinking?
- Have you or someone else been injured because of your drinking?
- Has a relative, friend, doctor, or other health worker been concerned about your drinking or suggested you cut down?

## Treatment

There are several types of substance use disorder treatment, including various behavioral therapies, motivational interventions, family counseling, contingency management programs, digital technologies, neuromodulation, harm reduction programs, support groups, 12-step programs, residential treatment, and medications (Cleveland Clinic, 2024c). Treatment plans should be individualized and consider each individual's unique needs. Goals should be patient-centered. The plan should consider the individual's age, gender identity, race and ethnicity, language, health literacy, religion/spirituality, sexual orientation, culture, trauma history, and physical and mental health problems. Personalized treatment is more

likely to be successful, and the treatment plan should be revisited often to make adjustments as needed (Open RN, 2022).

There is a range of substance use disorder treatment options that can be matched to the individual's needs and severity of substance use. Typically, a patient will begin treatment in an inpatient or intensive outpatient program. They may spend the first 3-7 days of treatment in a medically managed substance withdrawal program. This intensive care service is generally in an inpatient, acute care hospital setting. Medical and nursing care, along with the interdisciplinary team, work to manage withdrawal symptoms, mental health diagnoses, and any co-occurring physical health conditions. This is followed by a 1–3-month intensive rehabilitative care program that may be inpatient or an intensive outpatient program. Residential services are a 24-hour program but occur outside the hospital setting. These services provide support, structure, and clinical services. Residential services are often beneficial for individuals who do not have a home environment that supports recovery, have a history of relapse, or have complex physical or mental health diagnoses. Intensive outpatient care is typically 6-8 hours per day. It is most appropriate for individuals with a home environment supporting recovery but also requiring an intensive program structure. Outpatient intensive programs may be 2-5 days per week for a few months, and then the individual may progress to a traditional outpatient program that requires 1-2 sessions per month. Traditional outpatient services include group and individual behavioral support and medication management. Sessions are designed to fit an individual's schedule and may be offered before or after work, school, or even on the weekends. Individuals who are experiencing mild to moderate substance use disorder may begin at this level of care, or it can be used as part of a step-down model. After discharge from an inpatient program, individuals may choose to participate in recovery housing (Open RN, 2022).

Brief interventions describe the techniques used in medical settings that can help initiate change (Open RN, 2022). Typically implemented in settings where the primary purpose is not to address substance use, such as an annual well-visit, these techniques are most appropriate for mild to moderate substance use disorder and are most effective for alcohol use disorder. Brief interventions may include feedback, advice, and goal setting to reduce substance use or the risks associated with substance use (Volkow & Blanco, 2023). When these techniques are ineffective, the patient must be referred for treatment (Open RN, 2022).

Cognitive behavioral therapy (CBT) helps individuals develop more balanced and helpful thoughts about themselves, others, and their future. They can also learn skills to help manage the urge to misuse substances, refuse substances, use a problem-solving approach for their substance use disorder, and achieve their personal goals (VA, 2025). CBT aims to disrupt the learned associations of substance use and reward by promoting an awareness of patterns (Volkow & Blanco, 2023). Cognitive behavioral therapy can be valuable in identifying triggers that compel substance use and how to avoid the psychological need for the substance (Cleveland Clinic, 2022a). CBT is seen as highly effective, and evidence for its use for the treatment of several substance use disorders has been found in many randomized controlled trials (Volkow & Blanco, 2023). The goal of cognitive behavioral therapy is to avoid relapse. It is most effective when combined with medication treatment (Dydyk et al., 2024).

Dialectical behavior therapy focuses on teaching mindfulness techniques to help the individual manage their substance use disorder (Open RN, 2022). Dialectical behavior therapy is similar to cognitive behavioral therapy and works to help individuals manage their emotions and understand how their thoughts influence their behaviors (Cleveland Clinic, 2024e). Mindfulness helps individuals cope with the negative feelings associated with cravings (Cleveland Clinic, 2022a). Used in conjunction with other treatments, mindfulness techniques are beneficial in

individuals when they experience substance cravings (Open RN, 2022). Research has found that mindfulness training can reduce stress and prevent relapse (Lucas-Guerra et al., 2024).

Family behavior therapy can be used for both adolescents and adults. It not only addresses the substance use disorder, but also the challenges the family may be experiencing, including mental health disorders and conflict. Family behavior therapy focuses on developing skills and setting behavioral goals. The family discusses strategies to address activities of daily living, violence prevention, and HIV/AIDS prevention (Open RN, 2022).

Motivational interviewing is a patient-centered approach that can evaluate an individual's attitudes towards change. It uses a conversational approach and helps the patient think about their interest in changing their substance use behavior. The nurse can then begin to work with the patient to make a plan to change behavior (Open RN, 2022). Motivational interviewing promotes optimism, self-efficacy, and the ability to adjust to change (Cleveland Clinic, 2022a). In order to provide effective motivational interviewing, significant training is necessary (Volkow & Blanco, 2023). Research has found that individuals who participate in motivational interviewing are more likely to adhere to a treatment plan and achieve more favorable outcomes (Open RN, 2022).

Contingency management is a technique that provides tangible incentives for achieving recovery milestones. The incentives typically increase with consistent recovery behavior (VA, 2025). The theory behind contingency management is that since substance use disorder is motivated through reward and negative reinforcement of withdrawal, rewarding positive outcomes, like reduced use, can be effective. This technique has been used to treat different substance use disorders and can be used at various stages of recovery (Volkow & Blanco, 2023). Evidence shows that individuals who received a financial reward for staying

abstinent, participating in treatment, and attending consultation had a higher rate of abstinence than individuals who did not receive financial compensation (Lucas-Guerra et al., 2024). Longer-duration contingency management programs are more effective, though the abrupt discontinuation of the program is associated with relapse. It is recommended that the program be gradually tapered, with lower-value reinforcers used to decrease the risk of relapse (Volkow & Blanco, 2023). Community reinforcement approach is a type of structured contingency management technique that includes an intensive 24-week program, and participants are incentivized for their participation in counseling sessions and continued substance abstinence with vouchers that hold monetary value (Open RN, 2022).

Digital technologies have proven to be effective in screening, assessment, treatment, and recovery for individuals with substance use disorders who have access to technology. Those in underserved communities may be unable to engage in this technology effectively. However, digital technologies can improve privacy and increase engagement for those with smartphones or access to the internet. In some programs, the results can be automatically communicated to the electronic health record. This contributes to a sense of empowerment related to the patient's care. Technological advances in mobile and wearable sensing devices and complex machine learning contribute to new opportunities to deliver treatment interventions when the patient is most vulnerable (Volkow & Blanco, 2023).

Neuromodulation aims to strengthen frontal-cortical circuitry by enhancing executive function. This can have benefits for self-control and decrease cravings and discomfort. Non-invasive neuromodulation uses transcranial magnetic stimulation, direct current stimulation, and low-intensity focused ultrasound to target the prefrontal cortex. Neuromodulation of the peripheral nerves may be accomplished through percutaneous nerve field stimulation or trigeminal nerve

stimulation. Deep brain stimulation is an invasive technique where electrodes are surgically placed. This new technique is only just emerging, and while promising, more research is needed to establish efficacy and safety. Currently, neuromodulation through transcranial magnetic stimulation for smoking cessation and percutaneous nerve stimulation for the treatment of opioid withdrawal are the only neuromodulation techniques that are FDA-approved for substance use disorders (Volkow & Blanco, 2023).

Harm reduction focuses less on substance abstinence and more on minimizing adverse outcomes associated with substance use disorder. These interventions may include syringe services, increasing access to naloxone, overdose prevention centers, and drug checking. Organizations may engage in distributing sterile injecting equipment in an effort to prevent HIV and hepatitis C infections. Naloxone distribution in at-risk communities is one of the most effective strategies to reduce deaths associated with overdose. Overdose prevention centers are locations that provide a safe space for individuals to misuse a substance under supervision. These sites vary; some only provide supervision, while others are more comprehensive in program offerings, such as substance use disorder treatment, medical referrals, and housing. Research has shown these centers are effective in preventing overdose deaths, promoting substance use disorder treatment engagement, and preventing HIV and hepatitis C infections. Drug checking is a strategy developed in response to the increasing rate of fentanyl associated deaths. Fentanyl is the most common adulterant in heroin, counterfeit prescription pills, and stimulant drugs. More than half of all overdose deaths are related to fentanyl. Fentanyl test strips allow individuals to test if the substances they plan to use contain fentanyl or its derivatives (Volkow & Blanco, 2023).

Treatment service models for substance use disorder are inconsistent. It is recommended that treatment programs be accessible, affordable, evidence-based, diversified, and holistically focused. Services should be patient-centered,

equitable, and data-driven. The chronic care model is often used as it matches interventions with the intensity of the substance use disorder. Integration of substance use disorder treatment and treatment of other mental health disorders is vital and is also cost-effective and patient-centered. Individuals with mild substance use disorder can benefit from community care and self-help groups. In contrast, those with moderate and severe substance use disorder can benefit from outpatient or inpatient treatment. An element of the chronic care model includes addressing social determinants of health and social needs (Volkow & Blanco, 2023).

Support groups and 12-step programs, such as Alcoholics Anonymous and Narcotics Anonymous, help promote abstinence from substance use on their own, or in conjunction with other treatment modalities (Volkow & Blanco, 2023). Twelve-step programs focus on acceptance, surrender, and active involvement in the program. Acceptance requires the individual to understand that substance use is a clinical disorder, that the substance has caused their life to become unmanageable, that willpower alone is not enough to discontinue substance use, and that abstinence from the substance is the only long-term option to achieve wellness. The idea of surrender involves the individual submitting to a higher power, accepting fellowship and support of other individuals, and following the program activities (Open RN, 2022). Peer support, role modeling of successful recovery, mentoring, and oversight are all mechanisms that make these programs successful. Attendees report a sense of belonging and community, which reduces feelings of shame, loneliness, and guilt. They are also able to feel inspired by those in their program. Adaptive changes in social networks through 12-step programs can increase self-efficacy and reduce impulsivity and cravings. Research has found that 12-step programs for alcohol use disorder, specifically, are as effective, and possibly more effective, than other treatment modalities, including CBT (Volkow & Blanco, 2023).

Traditionally, substance use disorder treatment has been provided in a specialty program. The programs use evidence-based principles to provide effective treatment for adolescents and adults. These principles include the acknowledgment that addiction is a complex but treatable disease, no single treatment is going to work for everyone, treatment must be readily available, effective treatment needs to address the whole individual, not just their substance use, and remaining in treatment for an adequate period is necessary for recovery. Behavioral therapies should address motivation to change and include individual, family, and group counseling. The treatment plan must be continually evaluated and modified as the client's needs change. Treatment should also include effective management of other mental health disorders. Treatment does not have to be voluntary to be effective. Initiation of treatment should include testing for sexually transmitted infections, HIV/AIDS, tuberculosis, hepatitis, and other infectious diseases. Treatment interventions must be evidence-based, including medications, behavioral therapies, and recovery services (Open RN, 2022).

Multiple medications are used to treat substance use disorder, in conjunction with other types of therapies. Opioid replacement therapy focuses on substituting the problematic opioid with one that is safer. These substitutes are prescribed under medical supervision. Outpatient buprenorphine office therapy can help the patient avoid withdrawal symptoms with little or no euphoria. This type of therapy is effective for almost half of the patients who have opioid use disorder (Dydyk et al., 2024). There are also buprenorphine combination medications, such as Suboxone and naltrexone (VA, 2025). Methadone is another medication that is commonly used for opioid replacement. It is given in an outpatient setting in a specially monitored clinic. Methadone dosage is gradually increased, so another medication, like clonidine, may be administered until an effective dose is reached. Once the maintenance phase of methadone treatment is achieved, the patient may continue methadone treatment indefinitely. Nurses must educate patients

receiving methadone therapy that tapering off this medication can take weeks to months (Dydyk et al., 2024). Medications used to treat alcohol use disorder include acamprosate, disulfiram, naltrexone, and topiramate (VA, 2025).

Tobacco use disorder may be treated with nicotine replacement therapy, bupropion, and varenicline (VA, 2025). Bupropion lowers the absorption of norepinephrine and dopamine in the brain. Varenicline reduces nicotine cravings by stimulating the nicotinic receptor in the brain. Some evidence suggests it may be more effective than nicotine replacement therapy and bupropion. Other antidepressants, such as nortriptyline, may also be used to address nicotine dependence (Cleveland Clinic, 2022a). Nicotine replacement therapy, in conjunction with cognitive behavioral therapy, has proven to be an effective strategy to reduce nicotine use. Research has found that transdermal nicotine patches provide the most consistent rate of delivery and are best used in conjunction with other relievers, such as nicotine gum, lozenge, or spray (Leone & Evers-Casey, 2022). There are side effects to nicotine replacement therapy patches. These adverse effects may include dizziness, tachycardia, headache, muscle aches and stiffness, nausea, erythema, and insomnia. Adverse effects associated with nicotine replacement therapy gum and lozenge include bad taste in the mouth, tachycardia, hiccups, jaw aches, mouth sores, nausea, and sore throat. Adverse effects of the nicotine replacement therapy nasal spray include coughing, nasal irritation, runny nose, sneezing, throat soreness, and watery eyes. Side effects of the NRT inhalers include coughing, mouth and/or throat soreness, rhinorrhea, and dyspepsia (Cleveland Clinic, 2022a).

Tobacco use disorder can be complicated to treat, with withdrawal symptoms challenging to manage. Non-medication techniques for managing withdrawal symptoms may include exercise, spending time with friends who do not use tobacco and who are supportive of cessation, and keeping hands occupied with a stress ball or fidget toy. Some individuals may find it helpful to use substitutes for

the tactile experience of tobacco use. This may include using a straw, toothpick, or cinnamon stick for the sensation of something touching the lips and mouth. Gum chewing can also help with this (Cleveland Clinic, 2022a).

## Recovery

Recovery support services are a key component of substance use disorder treatment. Treatment programs or community organizations may provide these services. They are often facilitated by case managers, recovery coaches, or peers. Recovery coaches can be paid or volunteers who help individuals connect to community resources and help to address any barriers that may challenge the individual's recovery. Recovery coaches may provide strategies to maintain abstinence, help to identify recovery housing options, navigate social services, and help individuals develop skills that help them maintain recovery (Open RN, 2022).

Recovery-supportive housing is a substance-free environment where individuals can experience mutual support from other residents. Recovery housing is often helpful for individuals during or after outpatient treatment, and the length of stay is typically self-determined. Recovery housing support often includes helping individuals to access healthcare, find employment, manage their legal problems, and navigate social services. Community care centers may offer recovery coaching, education, and social events. Some recovery community centers encourage individuals to participate in advocacy to educate community members and combat negative public attitudes (Open RN, 2022).

Education-based recovery support services are aimed at helping high school and college students maintain their recovery in the school environment, which can be difficult when peers are actively involved in substance use. These programs connect students with others in recovery and help them develop social support that will enable them to complete their educational goals. Recovery support

services help individuals navigate systems of care, remove barriers to recovery, and stay engaged in their treatment program. These services also provide a context for individuals to experience a sober living community. Recovery support services also focus on healthy lifestyle techniques, reducing the risk of relapse, and achieving and maintaining recovery. Individuals who participate in recovery support services tend to have more favorable long-term recovery outcomes (Open RN, 2022).

Recovery from substance use disorder is an ongoing process. Even when an individual has achieved remission for one or two years, it may be 4-5 more years before their risk for relapse drops below 15%. Recovery support services are essential for long-term monitoring and management of these patients to maintain remission and ensure accessible resources are available in case of relapse (RN, 2022).

Substance use prevention strategies are varied, but most focus on avoiding the use of psychoactive substances. Most programs target children and adolescents because these developmental periods are associated with significant behavioral changes. For adolescents, there is also exposure to psychoactive substances and a greater influence of peer pressure. More preventative interventions are needed for individuals in other stages of life (Volkow & Blanco, 2023).

## Prevention

Preventative strategies address risk factors like deviant behaviors and enhance protective factors like parental support and education. Preventive programs may be implemented at school, within healthcare settings, or in family and community settings. Universal preventative interventions are used in areas of high risk. They target an entire population, such as all students at a given high school. The most common universal prevention strategy is school-based drug education. The most

effective programs utilize a social-influence approach and provide information, education about substance use prevalence among peers, refusal skills training, and life skills. These programs are typically mildly effective due to a lack of resources for sustainable implementation (Volkow & Blanco, 2023).

Interventions aimed at mothers during pregnancy or their child's infancy often focus on building parenting skills, may incorporate early childhood education services, and are designed to help prevent substance use later in life. However, additional research is needed to confirm the effectiveness of these programs (Volkow & Blanco, 2023).

Community-based programs may target a specific age group. Communities That Care is an organization that works to prevent adolescent substance use, violence, risky sexual behavior, and school dropout. These programs tend to be successful in high-risk communities in reducing risk factors for substance use disorders. Parent and family-based preventative interventions aim to reduce risk factors within the family and peer social relationships. This may equip parents with parenting skills such as communication, rule setting, and monitoring. They may also work to improve family relationships. Programs that focus on both the individual parents and the parent-child relationship are effective in preventing substance use disorder among adolescents (Volkow & Blanco, 2023).

Parents of adolescents can be advised of different strategies to prevent substance use disorder among their children. Parents should be encouraged to talk to their child about substance use. Parents must actively listen to their child talk about their challenges with peer pressure. Parents can be supportive of the child's efforts to resist peer pressure. Parents should also set a good example for their children by not misusing alcohol or other substances. They can also work to strengthen their relationship with their child, as a strong, stable bond can reduce the risk of substance misuse (Mayo Clinic, 2025b).

Digital media preventative interventions, such as video games created for educational purposes, have been widely implemented in recent years. Digital interventions provide flexibility for individuals who otherwise may have difficulty accessing prevention programs. Apps and text messaging services are growing strategies used among adolescents, but more research is needed to establish efficacy (Volkow & Blanco, 2023).

The prognosis for substance use disorder varies. Recovery is influenced by the type and severity of the substance use disorder, the individual's level of commitment to treatment and recovery, genetics, and coping skills. Substance use disorder is a chronic mental health condition that requires lifelong care. Different treatment strategies work for different people, and relapses are common. When a relapse occurs, the individual can become frustrated, especially when the relapse occurs many years after the last use of the substance. Strong support systems are key to successful recovery (Cleveland Clinic, 2024e).

Relapse prevention strategies are necessary to help an individual avoid returning to substance use. Patients should be advised to follow their treatment plan. When an individual is in recovery, they may feel they no longer need to monitor themselves. However, those who continue to participate in counseling, therapy, support groups, and medication treatments are more likely to avoid relapse. Individuals should avoid high-risk situations, like returning to areas where substances were obtained or spending time with people with whom they previously used substances. Individuals should be advised that if they do experience relapse, they should seek treatment immediately (Mayo Clinic, 2025b).

## Section 7 Personal Reflection

Why is the identification of substance use disorders an important aspect of treatment? What are some of the various treatment modalities used for

substance use disorders? Why is it necessary to be knowledgeable regarding different types of treatment? Why is it important for treatment to be personalized? What is remission, and why are recovery support services a vital aspect of remission? What should a nurse advise a patient to do if they experience a relapse? What are some methods to prevent substance use disorder?

## Section 8: Nursing Interventions

Nurses are integral in supporting individuals who are experiencing substance use disorder. When healthcare workers have negative attitudes toward patients experiencing substance use disorder, those individuals may avoid seeking treatment or other healthcare services. Conversely, nurses with a nonjudgmental attitude and seeking to enact interventions that benefit the patient will likely promote recovery and improve outcomes. Research has identified three major themes of nursing interventions that contribute to positive outcomes. Those themes are patient-centered care, empowerment, and maintaining support and capability enhancement (Tamayo & Lane, 2022).

Developing a therapeutic relationship with the patient can be an effective intervention in addressing substance use disorder. A healthy therapeutic relationship is based on empathy and is patient-centered. Therapeutic relationships can enhance effective communication, trust, patient engagement, and satisfaction. Nurses must seek to understand the patient's perspective, actively listen to them, and involve the patient in decision-making processes. Effective communication between the healthcare worker and the patient can help tailor treatment and interventions, and ultimately contribute to more positive outcomes (Xu & Liu, 2023).

Psychoeducation is a nursing intervention that empowers patients to actively participate in their treatment by making informed decisions. This education aims

to provide basic knowledge regarding the patient's particular substance use disorder, treatment options, and coping strategies. Psychoeducational interventions are associated with increased treatment adherence, reduced substance use, more effective symptom management, and positive recovery outcomes (Xu & Liu, 2023).

Telematic follow-up is an intervention that utilizes emergency hotlines, treatment locators, and virtual meetings with healthcare professionals. It can also include information sent by text message. Research has found that personalized interventions were effective in decreasing substance use, but automated communications were only effective at the beginning of the intervention (Lucas-Guerra et al., 2024).

Patient education does not only include information regarding the substance use disorder, but also must include medication management instruction. Patients with additional health conditions may be prescribed multiple medications, and they must understand how these medications interact and the importance of adhering to the medication treatment plan. Nurses should also educate patients regarding the risk of alcohol use alongside prescription medications used to treat substance use disorders (Xu & Liu, 2023). General health education focusing on healthy lifestyle habits has improved abstinence rates. This intervention is more effective when the patient can communicate daily with a healthcare professional, especially when they are experiencing withdrawal symptoms (Lucas-Guerra et al., 2024).

In addition to mindfulness principles that can be taught as part of cognitive behavioral therapy, nurses can teach relaxation techniques to encourage abstinence. They can also encourage physical exercise as a method to improve abstinence from substance use. These interventions were most effective when accompanied by telematic follow-up (Lucas-Guerra et al., 2024).

Nurses can work to prevent substance use disorder by providing patient education regarding preventive measures. Nurses should advise patients and their families to follow prescription medication instructions and only take the amount prescribed. Nurses should also advise patients never to share or sell prescription medications. They should be stored out of reach of children. Leftover prescription medications should be disposed of at a community drug take-back program or a pharmacy that can destroy unused medications. Nurses can also advise patients of the circumstances that can lead to substance use disorder. Times of stress and change, such as divorce or the death of a loved one, increase the risk of developing a substance use disorder. Patients should be advised to seek medical care if they are using a substance regularly and feel they are unable to stop on their own (Cleveland Clinic, 2024e).

Family education is necessary when someone in the home is involved in substance misuse. Nurses should educate family members regarding when to seek help. When the individual reports they cannot stop using a substance, there is continued use after they acknowledge the use is harmful, there is extremely risky behavior, including unprotected sex and sharing needles, or there are withdrawal symptoms when the substance is not used. The nurse should also educate family members on what symptoms elicit an emergency response. These are when there is a suspicion of overdose, changes in consciousness, trouble breathing, seizures, cardiac symptoms such as heart attack, chest pain, or pressure, and any other disturbing physical or psychological reaction (Mayo Clinic, 2025b).

One feature of substance use disorder is that the individual will typically deny they have a problem and will not voluntarily want to seek treatment. Interventions can occur at any time of the substance use disorder spectrum, but are most helpful when implemented early, before use worsens. Interventions should be carefully planned and done in consultation with a healthcare provider. Anyone who plays an important role in the individual's life can participate. This may include family,

friends, co-workers, clergy, coaches, or others who care for the individual. During the intervention, concerns are directly communicated to the individual in a group setting, consequences for continued use are presented, and the individual is offered treatment (Mayo Clinic, 2025b).

Nurses can provide many effective interventions related to substance use disorder, but they are also instrumental in preventing substance use disorders. Education and awareness must be communicated to patients as part of routine health promotion. Nurses should educate patients and their families regarding the risks associated with alcohol consumption and the need to learn to manage stress in a healthy manner (Xu & Liu, 2023).

## A Note for Nurses

An important note for nurses is that healthcare workers are not immune to substance use disorders. Nurses and other healthcare workers may continue to practice while experiencing substance use disorders, endangering the lives of their patients. Nurses are required to report suspicion of substance use disorder to their supervisor. Nurses may observe behavioral changes, physical signs, and drug diversion in a coworker. There may be a noticeable decrease in job performance, lengthy absences from the unit, frequent bathroom breaks, tardiness, leaving work early, and making excessive mistakes, including medication errors. The individual's appearance may change, become increasingly isolated from coworkers, have inappropriate verbal or emotional responses, diminished alertness, confusion, or memory lapses (Open RN, 2022).

Drug diversion occurs when a healthcare worker redirects a substance from its intended destination, either the patient, inventory, or waste, to their own personal use, sale, or distribution to others. Drug diversion includes drug theft, use, and tampering, which could be diluting or substituting a medication. Nurses

should be aware of signs of medication diversion, including frequent discrepancies in opioid inventory counts, an unusually high amount of opioid waste, excessive corrections made to medication administration records, frequent reports of ineffective pain management from patients, offers to administer pain medications to patients not assigned to them, and altered verbal medication orders. Timely identification and treatment of substance use disorder among nurses can increase the likelihood of the nurse's ability to return to work. Most states have a non-disciplinary treatment and recovery program to support nurses experiencing substance use disorder. Nurses who work with an individual returning to work after substance use disorder treatment should be supportive and encouraging of recovery (Open RN, 2022).

### Section 8 Personal Reflection

What are the three major themes of nursing interventions associated with substance use disorder? Why is the development of a therapeutic relationship important? How does education empower individuals? How does substance use disorder affect nurses and other healthcare workers?



## Section 9: Conclusion

Substance use disorder is a widely prevalent chronic condition that nurses will encounter in many settings. When nurses are prepared with an understanding of what substance use disorder is (and what it is not), they are better prepared to interact with patients in a nonjudgmental, therapeutic manner. The terminology used regarding substance use disorders has changed in recent years. Person-first language recognizes the dignity of the individual and focuses on substance use disorder as a chronic clinical condition rather than a moral failing. Understanding the science of addiction helps nurses begin to break the stigma surrounding

substance use disorder. There are many different types of substance use disorder. When nurses are knowledgeable regarding the unique aspects of various types of substance use disorder, they can provide more individualized nursing care. While different substance use disorders may have different signs and symptoms, there are consistent signs and symptoms when an individual is experiencing a substance use disorder. When nurses are knowledgeable about these, they are better prepared to educate patients and families. Hence, they are better prepared to recognize when recreational substance use has become a substance use disorder.

The identification of risk factors for substance use disorder can help healthcare workers provide support for those at increased risk. Risk factors for substance use disorder do not guarantee that the individual will experience substance use disorder. Nurses can educate their patients, families, and communities that substance use disorder is a multifactorial illness and that biological and social risk factors influence the development of substance use disorder. There are many treatments available for substance use disorder. Nurses and other healthcare workers must understand the patient's unique needs to create an individualized treatment plan. When nurses are knowledgeable regarding the various types of treatment, they are also better prepared to answer questions their patients may have. Nursing interventions support the various treatment modalities and provide holistic, patient-centered care. Though substance use disorder is a prevalent healthcare problem, nurses can play an integral role in the prevention and treatment of substance use disorders, improving both individual health outcomes and the health of communities.

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