

# Substance Use Disorders



# Defining Substance Use Disorders

Substance use (SU) is a more comprehensive term than drug use that encompasses not only use of drugs, but excessive or illegal use or misuse of any substance. Many of the substances being excessively, illicitly, or inappropriately used had their legal acceptability stripped as information regarding their unpleasant and/or dangerous effects were amassed. Some substances retained their legal status but carry warning labels about their deleterious side effects. Some substances have always been illegally produced and marketed, only available on the black market. Many legal substances are traded on the black market as well (Casey, 1978). Resources such as the Diagnostic and Statistical Manual, Fifth Edition (DSM-5) and the Treatment Episode Data Set (TEDS) are commonly used to define substance use disorders (SUDs). The DSM-5 manual provides the standard classification of behavioral health disorders for professionals across the country (American Psychiatric Association Web site, n.d.; NIDA, 2014). It focuses on diagnoses. TEDS, on the other hand, is an admissions-based system.

## Diagnostic and Statistical Manual (DSM)-5: Substance Use Disorders (SUDs) Classifications

As the standard classification of mental disorders, including substance-related disorders, the intent of the DSM was to be applicable in a wide array of contexts and for use by diverse clinicians and researchers of many different orientations (e.g., psychodynamic, biological, behavioral, cognitive, interpersonal, or family/systems). This most recent version, the DSM-5, has been designed for use across clinical settings (outpatient, inpatient, partial hospital, clinic, private practice, primary care, and consultation-liaison), with community populations. It can be used by a wide range of health and behavioral health professionals, including psychiatrists and other physicians, psychologists, nurses, social workers, occupational and rehabilitation therapists, and counselors. The DSM is also a necessary tool for collecting and communicating accurate public health statistics (American Psychiatric Association Web site, n.d.). The fifth edition of the Diagnostic and Statistical Manual (DSM-5) includes a wealth of changes to definitions of psychiatric disorders, including substance-related disorders. For example, there is no more distinction between abuse and dependence in the DSM-5 (American Psychiatric Association, 2013; Grohol, 2013). The categories of substance abuse and substance dependence were combined into a single overarching disorder known as substance use disorders (SUDs) (MDHS/ADAD, 2013). Moreover, the threshold for substance use disorders (SUDs) is now at least two (2) criteria. In the DSM-IV-TR, one or more criteria were required for a diagnosis of abuse and at least three (3) criteria were necessary for a diagnosis of dependence. Craving (a strong desire/urge to use a substance) was added as a criterion and “recurrent legal problems” was deleted. In addition, criteria for SUDs are accompanied by criteria for intoxication. Polysubstance dependence, caffeine use disorder\*, and the physiological subtype have also been deleted. (\*Caffeine use disorder is included in Section III of the DSM-5 so that further research to support it as a clinically significant disorder is encouraged.) Cannabis withdrawal and caffeine withdrawal were added as new diagnoses. Severity was defined by three (3) categories: mild (two to three criteria); moderate (four to five criteria); and severe (at least six criteria). Even the title for the disorder was expanded to include addictive disorders (American Psychiatric Association, 2013;

Grohol, 2013). However, this discussion will focus solely on SUDs and omit substance-induced disorders and addictive disorders.

Substance use disorders (SUDs) per the DSM-5 comprise a cluster of physiological, cognitive, and behavioral symptoms which indicate an individual continues to use a substance despite substantial substance-related problems. A salient feature of SUDs is the underlying change in brain pathways that may continue to be evident well after detoxification, particularly when the SUD is severe.

The diagnosis of SUD can be applied to nine (9) classes of drugs: 1) Tobacco; 2) Cannabis; 3) Inhalants;

4) Stimulants; 5) Opioids; 6) Alcohol; 7) Hallucinogens; 8) Sedatives, hypnotics, and anxiolytics; and 9) Other/Unknown substances. These substances may be obtained over the counter, by prescription, and/or illegally. Behavioral effects of brain changes from use of these substances may become manifest in repeated relapses, as well as intense drug cravings, when people with SUD are

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exposed to substance-related stimuli (American Psychiatric Association, 2013).

Criterion A, which encompasses four (4) groupings, contains the primary behaviors to be considered in relation to use of the substance. These groupings address impaired control, social impairment, risky use, and pharmacological criteria. Criteria 1-4 cover impaired control over substance use, Criteria 5-7 focus on social impairment, Criteria 8-9 deal with risky use of the substance, and Criteria 10-11 constitute pharmacological criteria. It should be noted that withdrawal symptoms vary significantly across the classes of substances so separate criteria sets for withdrawal are provided for each class. Clinicians are also admonished not to count symptoms of withdrawal and tolerance that occur during appropriate medical treatment involving prescribed medications when diagnosing an SUD (American Psychiatric Association, 2013).

## Tobacco Use Disorders (TUDs).

In the DSM-5, tobacco use disorders (TUDs) are displayed under the heading Tobacco-Related Disorders. These disorders are common in persons who use smokeless tobacco and cigarettes daily. The disappearance of nausea and dizziness after repeated intake, along with more intense effect of tobacco the first time it is used during the day, exemplifies tolerance to the substance. For many persons with the disorder, tobacco relieves or helps with avoidance of withdrawal symptoms that may occur after stopping use. Cravings are often reported when individuals do not smoke for several hours. Some individuals spend excessive amounts of time using tobacco, as can be evidenced by chain-smoking. There are also times when individuals forego important occupational, social, or recreational activities because they take place in tobacco use-restricted areas. Persons with TUD rarely fail to fulfill major role obligations such as work or home responsibilities, and neither do they spend inordinate amounts of time trying to procure tobacco. They may have persistent interpersonal or social problems or engage in use that is physically hazardous, e.g., smoking in bed

or around flammable materials. Those who endorse these criteria may have a more severe TUD (American Psychiatric Association, 2013).

Cigarettes comprise the most commonly used tobacco product, representing more than 90 percent of nicotine/tobacco use. In the United States, slightly more than one fifth of adults are current cigarette smokers, less than five percent use smokeless tobacco, and less than one percent engage in tobacco use in cigars and pipes. Among adults 18 years of age and older, the 12-month prevalence of nicotine prevalence (DSM-IV) is 13 percent, with similar rates across gender. Prevalence of current nicotine dependence is higher among Native American and Alaska Natives than among Whites (23 percent versus 14 percent). Lower prevalences are found for African Americans (10 percent) and Asian Americans/Pacific Islanders and Hispanics (six percent each).

Experimentation involving tobacco use typically begins in adolescence and around 20 percent are smoking at least monthly by the age of 18 years. A majority of these individuals, though, become daily tobacco users. Moreover, a large portion of persons have met current TUD criteria by late adolescence. While more than 80 percent attempt to quit at some time, 60 percent relapse within a week. Further less than five percent are able to remain abstinent for life. Persons with externalizing personality traits such as young people with conduct disorder or adults with anxiety disorder are more likely to initiate tobacco use, as well as continue use and develop TUD. It appears that persons with low educational levels and low incomes are more likely to begin tobacco use and less likely to quit. There is also a genetic component to TUD (American Psychiatric Association, 2013).

Medical consequences of tobacco use typically shows up when users are in their 40s, becoming progressively more debilitating over time. Most of the medical conditions result from exposure to tars, carbon monoxide, and other non-nicotine components of tobacco. Fifty percent of smokers who fail to quit will die early from a tobacco-related illness. Present evidence suggests that long-term use of nicotine medications do not cause medical harm (American Psychiatric Association, 2013).

## **Cannabis Use Disorders.**

The DSM-5 lists this disorder under the heading Cannabis-Related Disorders. It includes problems associated with substances derived from the cannabis plant and synthetic compounds that are chemically similar. The concentrated extraction known as hashish is also included. The potency of cannabis varies greatly, ranging from one to 15 percent in usual cannabis plant material 10 to 20 percent in hashish. However, a steady increase in potency has been observed in seized cannabis over the last 20 years. Sometimes cannabis use disorder is the sole diagnosis involving cannabis users. Frequently, though, cannabis use disorders (CUD) show up concurrently with other substance use disorders, e.g.,

alcohol use disorder, etc.). When polysubstance use is involved, symptoms related to cannabis use may be minimized. People who report using cannabis persistently typically report behavioral and pharmacological tolerance to most effects,

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though tolerance is lost when cannabis use is stopped for at least several months, e.g. (American Psychiatric Association, 2013).

Some individuals with CUD spend many hours each day under the influence while use throughout the day may take place over a period of months or years for others. Even those who use less frequently may still experience recurrent problems related to school, work, family, and other important activities. A common feature of CUD includes arguments with parents or significant others over the use of cannabis in the home or in the presence of children that result in impaired family functioning. Moreover, persons with CUD may keep using despite knowing about the psychological and physical problems linked with its use.

Often noted is the fact that cannabis use contributes to the worsening of symptoms in persons diagnosed with other mental disorders as well as other increased psychological and/or physiological problems such as difficulty sleeping, change in mood, etc. Also some users of cannabis resort to minimization of the frequency and/or amount of their use, so it is extremely important to be cognizant of common symptoms and signs pointing to the disorder. Similar to other substances, experienced cannabis users develop pharmacological and behavioral tolerance, making it difficult to detect when they are indeed under the influence. Nevertheless, signs of acute and chronic use comprise yellowing of finger tips, chronic cough, red eyes, odor from the substance on clothing, the burning of incense, and exaggerated impulse/craving for certain foods, sometimes at strange times of the day or night (American Psychiatric Association, 2013).

Without a doubt, cannabinoids, and particularly cannabis, are the most widely used illegal psychoactive substances in the United States. The 12-month prevalence rate is about 1.5 percent among adults at least 18 years of age and 3.4 percent among 12-to-17-year olds. Rates are higher among males than females across adults and young people. As expected, the highest 12-month prevalence rates are for 18 to 29 year olds, with the lowest rates for persons 65 years of age and older. For adults, Native Americans and Alaska Natives demonstrate the greatest 12-month prevalence (3.4 percent). Rates are also highest among Native Americans and Alaska Natives (7.1 percent) for 12-to-17-year olds (American Psychiatric Association, 2013).

Onset of CUD happens most frequently during adolescence or young adulthood. Cannabis use disorder (CUD) typically develops over time, where pervasive patterns show gradual increases in amount and frequency. Among one of the first substances that young people try, the belief that cannabis is not as harmful as tobacco or alcohol likely contributes to its increased use. Moreover, it has been suggested that trends in onset rates be regularly re-evaluated in light of use and availability of “medical marijuana”. Clearly the best predictor of CUD is early onset cannabis use (i.e., use before the age of 15 years). This early use correlates highly with externalizing behaviors, especially conduct disorder (American Psychiatric Association, 2013).

The distinction between problematic and nonproblematic use of cannabis can be extremely difficult to make, especially when people report using a variety of substances, including cannabis. It is also true that acute adverse reactions to cannabis should be distinguished from the symptoms of major depressive disorder, bipolar disorder, delusional disorder, panic disorder, or schizophrenia. Chronic cannabis use can lead to a lack of motivation that resembles dysthymia. Of course, urine tests can be helpful in making the diagnosis (American Psychiatric Association, 2013).

Synthetic marijuana, otherwise known as Spice, K2, Skunk, or Moon Rocks, has been soaring in popularity in recent years. It has been marketed as a safer alternative to traditional marijuana, but the drug is dangerous and can be deadly. Since 2009, these drugs have killed more than one thousand Americans, many of them high school students. The psychoactive ingredients in synthetic marijuana bind to the brain's CB1 receptors and are very likely to cause everything from seizures to psychosis because of its potency (Brodwin, 2015).

The Drug Enforcement Administration (DEA) in the United States Department of Justice issued a statement prohibiting the production, possession, and sale of any of the five different chemicals that are used to produce fake marijuana. This action also made byproducts such as K2 and Spice illegal. Makers of synthetic marijuana frequently and rapidly change up the specific ingredients and produce the drug in such massive quantities, making drug enforcement tough (Brodwin, 2015).

## **Inhalant Use Disorders (IUDs).**

Inhalant-Related Disorders is the header that captures Inhalant Use Disorder (IUD) in the DSM-5. Inhalants can be defined as chemical vapors that individuals inhale on purpose to get “high” (NIDA for Teens, 2012). The National Survey on Drug Use and Health (NSDUH), administered to persons 12 years of age and older regarding their use of specific substances in the past month as well as the past year, defines inhalants as ‘liquids, sprays, and gases that people sniff or inhale to get high or to make them feel good.’ These substances are legal, harmless when used as intended, and found in many typically used products such as glue and spray paint (The NSDUH Report, March 2014). Many problems associated with the use of other substances can be manifested in inhalant use. Mild withdrawal and tolerance are each reported by close to 10 percent of people who use inhalants. Among adults reporting previous episodes of anhedonia or low mood, inhalant use disorder (IUD) is associated with past suicide attempts (American Psychiatric Association, 2013).

When all Americans 18 years of age and older are considered, prevalence for IUD is 0.02 percent. It increases to 0.1 percent for persons in the 18-29 year-old age group and nears one half of one percent for American youth ages 12-17 years. IUD in adults includes almost no females and is comprised of predominantly European Americans. In adolescents, prevalence is highest in Native Americans. Prevalence of IUD declines after adolescence, often remitting in early adulthood (American Psychiatric Association, 2013). Adolescent trends showed encouraging rates of decline between 2002 and 2012. In fact, past year inhalant use among 12- to 17-year-olds has been on the

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decline since 2006. Moreover, 2012 reflected the lowest rate in any year from 2002. Rates for male adolescents (12 to 17 years) also showed statistically significant declines compared to the 2011 rate (The NSDUH Report, 2014).

Among the most commonly used inhalants for 12 to 17 year olds include shoe polish, glue, gasoline, and spray paints. Nearly 20 percent of the young people who use inhalants develop IUD. Call to poison centers for intentional abuse of inhalants tend to spike for people around 14 years of age. If the IUD extends into adulthood, there are typically severe

problems for the individual, including suicidal ideation with attempts, antisocial personality disorder, and SUDs (American Psychiatric Association, 2013).

There are numerous signs and symptoms that may lead clinicians to consider the “IUD” diagnosis. In some instances, criteria for inhalant use disorder cannot be met, i.e., less than two criteria are present. Moreover, symptoms associated with IUD can manifest while using other substances, especially sedating substances such as alcohol, barbiturates, etc., hence making it difficult to diagnose the inhalant use disorder (IUD). Further, people with IUD may present with symptoms of neoplastic, metabolic, infectious, or toxic disorders that impair peripheral or central nervous system function or disorders that have damaged other organs such as renal damage. It should be noted that individuals can show inhalant intoxication and use without meeting criteria for IUD. However, IUD should not be considered as a diagnosis when there has been continuous/repeated exposure to inhalants but history or individual reports do not support intentional inhalant use (American Psychiatric Association, 2013).

In general, people with IUD who are receiving clinical care have many other substance use disorders. In adults, IUD typically co-occurs with antisocial personality disorder. Comorbidity in adolescents is linked to conduct disorder (American Psychiatric Association, 2013).

## Stimulant Use Disorders.

The header Stimulant-Related Disorders includes stimulant use disorders (StUDs) in the DSM-5. Amphetamine and amphetamine-type stimulants as well as substances with similar effects though structurally different (e.g., methylphenidate) fall under the category of StUDs. The substances are most often taken through the mouth or intravenously, but other routes of administration might also be used. Tolerance develops with repeated use; however, onset of StUDs tends not to be overly rapid (e.g., within a week).

People with StUD commonly develop conditioned responses to substance-related stimuli, e.g., craving at the sight of any white powderlike substances (American Psychiatric Association, 2013).

Violent or aggressive behavior tends to be common when high doses are taken.

Higher-dose use may also be linked to the psychotic episodes and paranoid ideation that resemble schizophrenia as well as anxiety that resembles generalized anxiety disorder or panic disorder. People with StUD commonly develop conditioned responses to substance-related stimuli, e.g., craving at the sight of any white powderlike substance. It is these responses that contribute to relapse, are extremely hard to quench, and continue well after detoxification (American Psychiatric Association, 2013).

As with many SUDs, prevalence rates for StUDs of the amphetamine type are highest in Native Americans and Alaska Natives (0.6 percent) among adults. On the other hand, Whites and African Americans demonstrate the highest prevalence rates (0.3 percent) among 12 to 17 year olds. Prevalence rates for cocaine-based StUDs tend to show similar patterns. Native Americans demonstrate the highest rates (0.8 percent) for adults. For 12 to 17 year olds, Hispanics, Whites,

Pacific Islanders tend to exhibit comparable rates (0.2 percent). Surprisingly, StUD involving cocaine is virtually nonexistent for adolescent Native Americans and Alaska Natives. Regardless the type of StUD, 12-month prevalence rates are higher among young adults in the 18 to 29 year age range (American Psychiatric Association, 2013).

Stimulant use disorders (StUDs) occur at all levels of society. However, first regular use (based on data from individuals in treatment) tends to occur around 23 years of age. The average age increases to 31 years for primary methamphetamine treatment admissions (American Psychiatric Association, 2013). Use tends to be related to the perceived need for performance enhancement at work, athletics, or school or for weight control. Chronic daily use can involve low or high doses, but higher dosages tend to accompany longer periods of use. StUD develops more rapidly and takes on greater severity when the stimulants are taken intravenously or smoked (American Psychiatric Association, 2013).

In particular, the effects of stimulants should be distinguished from the symptoms of generalized anxiety disorder, panic disorder, schizophrenia, and depressive/bipolar disorders. The clinical picture of StUDs can also look like intoxication with phencyclidine or synthetic 'designer drugs'. Often StUDs co-occur with other SUDs involving substances with soporific properties. Users of amphetamine-type stimulants generally use cannabis while cocaine users prefer alcohol. StUD can be linked to gambling disorder, antisocial personality disorder, attention-deficit/hyperactivity disorder, and posttraumatic stress disorder. Persons seeking treatment for cocaine-related problems many times present with cardiopulmonary problems, with the most common being chest problems (American Psychiatric Association, 2013).

Synthetic stimulants are on the rise as substances of use/misuse, especially in areas throughout Florida, Ohio, Texas, and Tennessee. The schedule I controlled substance,  $\alpha$ -PVP ( $\alpha$ -pyrrolidinovalerophenone) and known on the street as "flakka" or "gravel", is the new culprit. The drug can be eaten injected, snorted, or vaporized in e-cigarettes. It is easily purchased over the Internet and has been nicknamed "\$5 insanity" because it's cheap and precipitates bizarre behaviors in its users. User experiences range from hallucinations, paranoia, agitation, and bizarre behaviors to delusions of extraordinary strength. When delirious the user may become a danger to others as well as to himself/herself. He/she will usually vigorously struggle, with consequences including seizures, arrhythmias, and death. That is why healthcare providers and law enforcement have been admonished to be cautious when restraining individuals that have used this drug (McMillen, 2015). Users refer to flakka as "meth on steroids" (Little, 2015).

Bath salts or synthetic cathinones are another amphetamine-like stimulant. Many of the behaviors reported with flakka are associated with bath salts. These drugs are typically taken orally, inhaled, or injected. The worst outcomes have been linked to snorting the drug or through needle injection. Furthermore, these drugs contain a lot of unknown ingredients (NIDA, 2012b). In our country, bath salts have been linked to an alarming number of visits to emergency departments and/or calls to poison control centers (NIDA, 2012b; RxList, 2013).

## **Opioid Use Disorders.**

These disorders are shown under the header Opioid-Related Disorders in the DSM-5 (American Psychiatric Association, 2013). Opioids are medications used to eliminate pain. Substances such as

codeine, hydrocodone, oxycodone, and morphine fall within this drug class (NIDA, 2013). Opioids are often purchased on the illicit market but may also be obtained via prescription. In some cases, the prescription is legitimate but in other cases, prescriber name and/or dosage amount have been altered. Opioid Use Disorders (OUDs) comprise signs and symptoms of prolonged, compulsive self-administration of opioids that are used in doses much larger than needed for a particular medical condition or for which there is no legitimate medical use purpose. Withdrawal tends to

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accompany abrupt discontinuation of opioids (American Psychiatric Association, 2013).

Use and abuse of opioids have risen markedly in our country. It has been reported that the increased (opioid) abuse coincides with the availability of high-purity

heroin and the controversial campaign against the undertreatment of pain. The problem is dramatically illustrated by the following statistics.:

Americans consume:

- Approximately **80** percent of the world's opioid supply but comprise less than **five** percent of the world's population.
- **99** percent of the world's hydrocodone supply.
- About **67** percent of the world's illicit drugs (Preda, 2014).

Prevalence rates tend to be higher for males than females, 3 to 1 for opioids involving heroin and 1.5 to 1 for opioids excluding heroin. However, female adolescents have a greater likelihood of developing OUDs than males. Community 12-month prevalence rates for adults (at least 18 years of age) are almost 0.4 percent. The rates are lower among adolescents in the community population (ages 12-17). Overall, the rate for adolescents is around 1.0 percent, with rates for heroin use substantially lower (less than 0.1 percent). Prevalence of OUD tends to decrease with age, though there is overrepresentation among adult Native Americans (1.25 percent). It should be noted that 12-month prevalence rates for OUDs may be underestimated because of the high number of persons with the disorder that are incarcerated (American Psychiatric

Association, 2013).

OUD typically becomes problematic in the late teens or early 20s (American Psychiatric Association, 2013). Two thirds of teens and young adults who use prescription opioids get them from

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family and friends, often for free when sharing medication or without their families or friends knowing (NSDUH, 2011). In general, OUD continues for many years once developed, despite brief periods of abstinence. Relapse following abstinence is quite common, even in treated populations. Only about 20 to 30 percent of persons with OUD demonstrate long-term abstinence. Military service personnel are the exception. For example, better than 90 percent of the opioid users that served in the military in Vietnam achieved abstinence after they returned home. Unfortunately, many of these military service personnel also experienced increased rates of amphetamine or alcohol consumption use disorder, along with elevated rates of suicidality. Early death and symptom remission after 40 years of age contribute to the decrease in prevalence in later years. Nevertheless, many persons with OUD continue to meet criteria for the disorder for decades (American Psychiatric Association, 2013).

Unlike most other substances of abuse, opioids are less likely to produce symptoms of mental disturbance. Viral (e.g., hepatitis C virus, HIV, etc.) and bacterial infections are commonly associated with OUDs, especially when the substances are injected. Persons with OUD are further at risk for the development of mild to moderate depression (e.g., dysthymia), at minimum, as well as the more severe major depressive disorder (MDD). Individuals with OUD also have insomnia. Antisocial personality disorder occurs with greater frequency in persons with OUD as well as posttraumatic stress disorder. A history of conduct disorder in youth is a significant marker for OUD in adulthood (American Psychiatric Association, 2013).

## **Alcohol Use Disorders.**

Alcohol use disorders (AUDs) are found under the heading Alcohol-Related Disorders in the DSM-5. They are associated with problems related to other substances, in most instances, because alcohol is either used to substitute for the other substances when they are not available or to assuage the unwanted effects of the other substances. Repeated intake of high doses of alcohol especially affects the gastrointestinal tract, the central and peripheral nervous systems, and the cardiovascular system. There is also an increased rate of completed suicide and suicidal behavior in persons with these disorders (American Psychiatric Association, 2013).

There are three flavors of the disorder--mild, moderate and severe, and a total of 11 possible symptoms associated with the disorder. Two symptoms are necessary for the disorder to be classified as mild, four symptoms must be present for a moderate specifier, and at least six symptoms are needed to achieve a severe specifier. Persons showing tolerance and withdrawal are presenting with a mild alcohol use disorder. If individuals drink only in a binge-like manner such that tolerance and withdrawal do not develop to a level that either can be counted, the presentation falls in the moderate range. Binge-like drinking where tolerance and withdrawal are counted results in a more severe presentation of the disorder (Gitlow, 2013).

Not surprising, alcohol use disorder (AUD) is a very common disorder. The 12-month prevalence in the United States is estimated to be 8.5 percent among adults at least 18 years of age and 4.6 percent among 12-to-17-year olds. Rates are higher among adult men than adult women and lowest among persons at least 65 years of age. For adults, Native Americans and Alaska Natives demonstrate the greatest 12-month prevalence (12.1 percent). Rates are highest among Hispanics

and Native Americans and Alaska Natives (6.0 percent and 5.7 percent respectively) for 12-to-17-year olds American Psychiatric Association, 2013).

AUD has a variable course. A person may decide to stop drinking, likely in response to a crisis, with weeks of abstinence and limited periods of controlled/nonproblematic drinking. However, consumption is likely to escalate once drinking is resumed and severe problems will again re-appear. In young people, conduct disorder typically co-occurs with AUD (American Psychiatric Association, 2013).

Differential diagnosis of AUD includes nonpathological use of alcohol; sedative, hypnotic, or anxiolytic use disorder; and conduct disorder in childhood /adult antisocial personality disorder. Schizophrenia, antisocial personality, and bipolar disorders are linked to markedly increased rate of AUD. Depressive disorders and several anxiety disorders are also possibly related to AUD (American Psychiatric Association, 2013).

## **Hallucinogen-Related Disorders, Specifically Phencyclidine Use Disorders.**

Under hallucinogens, this section will focus specially on phencyclidine use disorders (PUDs). Substances associated with PUDs consist of phencyclidine (often referred to as angel dust or PCP) as well as less potent, similarly acting compounds such as cyclohexamine, dizocilpine, and ketamine. Showing up as street drugs in the 1960s, these substances produced feelings of separation from the body and mind in low doses, and coma/stupor at higher doses. PUDs take eight (8) days or more to be totally eliminated from the body. However, the hallucinogenic effects may last for weeks in certain individuals and episodes resembling schizophrenia may become persistent (American Psychiatric Association, 2013).

Prevalence estimates for phencyclidine use disorder (PUD) are less firm than for other substances. Nearly 2.5 percent of the population reports ever using phencyclidine. Rates range from less than

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0.5 percent for adolescents 12 to 17 years old to about 3.0 percent for adults at least 26 years of age. A spike occurred in past-year use and ever used categories for 12<sup>th</sup> graders. It should also be noted that persons admitted to substance use treatment facilities with phencyclidine as their primary substance tended to be younger and less educated than admissions for other

substance use. Moreover, admissions with phencyclidine as the primary are more likely found in the Northeast and West region of the United States (American Psychiatric Association, 2013).

It will be important to distinguish the effects of phencyclidine from those of other substances. However, phencyclidine is often an additive to substances such as cocaine and cannabis. In addition, it will be paramount that clinicians be able to discern whether behaviors associated with

other psychiatric disorders occurred before the intake of phencyclidine (American Psychiatric Association, 2013).

## **Sedative, Hypnotic, and Anxiolytic Use Disorders.**

Sedative, hypnotic, and anxiolytic use disorders (SHAUDs) are displayed under the header Sedative-, Hypnotic-, or Anxiolytic-Related Disorders in the DSM-5. Among the substances linked to SHAUDs are carbamates, barbiturates and barbiturate-like hypnotics, and benzodiazepines and benzodiazepine-like drugs. This class of substances includes practically all prescription antianxiety medications as well as all prescription sleeping pills. The substances can be obtained legally or illegally. Misuse may occur through overuse of the substance alone or in conjunction with other substances, e.g., methadone. As with other substances that might be available through prescription, it is necessary to determine whether they were appropriately prescribed and used. Tolerance to brain stem depressant effects will develop much more slowly. Sudden onset hypotension and respiratory depression that may lead to death can occur as the individual increases intake of the substance to achieve euphoria and/or other desired effects (American Psychiatric Association, 2013).

The 12-month prevalences tend to be slightly higher for males in adulthood but higher for females among the 12 to 17 year olds. Native Americans and Alaska Natives have the greatest 12-month prevalence (0.8 percent) as adults. Whites have the greatest rates (0.3 percent) for adolescents 12 to 17 years of age (American Psychiatric Association, 2013).

The typical course of SHAUD involves young people in their teens or early 20s who expand their occasional illegal use to the point at which they develop problems that meet criteria for diagnoses. Another less traveled clinical course

involves a prescription from a physician, usually to treat insomnia, anxiety, or somatic complaints. As the need for higher doses develops, individuals begin to self-administer to the point that substance-seeking behavior becomes the norm (American Psychiatric Association, 2013).

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It is important that SHAUD be differentiated from alcohol use disorder (AUD). It is also possible that some features of SHAUD may be the result of prior head trauma (e.g., subdural hematoma) or another medical condition (multiple sclerosis, e.g.). Finally, be clear that continued use of these drugs over four weeks is rarely indicated (American Psychiatric Association, 2013).

## Other/Unknown Substance Use Disorders.

Other (or Unknown) Substance-Related Disorders is the header for other (or unknown) substance use disorder (O/U SUD) in the DSM-5. Substances associated with these disorders do not readily fit into a class of drugs that are the focus of this section. In many cases, the substances are unrelated to the standard drug classes. For example, cortisol, antiparkinsonian medications, anabolic steroids, anti-inflammatory drugs, nitrous oxide, etc. are captured in this class. Also included are substances which cannot be identified either by the individual or because they are sold under fake names. O/U SUDs are mental disorders for which repetitive use of unknown and/or other substances continues, even when the person knows the substance(s) creates serious problems for him or her. The

Support for an “other/unknown substance use disorder” diagnosis may be based on a person’s statement that the substance is not from one of the nine classes of drugs (American Psychiatric Association, 2013).

problems must be reflected in the diagnostic criteria. Support for an O/U SUD diagnosis may be based on a person’s statement that the substance is not from one of the nine classes of drugs. Symptom characteristics can also suggest an unidentified substance. Moreover, suicide risks may be as prominent as with known substances. However, there is no evidence of unique risk

factors associated with the anonymity/uncertainty of the substance(s) linked to the disorder (American Psychiatric Association, 2013).

Prevalence data are limited but estimations suggest rates are lower than for any of the known substance classes. Course of development is not singly focused either. More often than not, O/U SUD gets re-classified once the other or unknown substance has been identified (American Psychiatric Association, 2013).

O/U SUD as a diagnosis in adolescence may be more difficult to assign because much of the use does not meet the standard of two or more criteria in the past year. Consistent with use of other substances, use of other/unknown substances typically does not occur in a vacuum. Most often these substances are taken concurrently with other substances. Thus, it becomes very important to inquire regarding symptoms that persist when some of the other substances are not being used. O/U SUD should be distinguished from sleep disorder, major/mild neurocognitive disorder, psychotic disorder, delirium, anxiety disorder, depressive disorder, or sexual dysfunction. Medical disorders may also be present with O/U SUD (American Psychiatric Association, 2013).

## Substance Use Disorders (SUDs) in Treatment Episode Data Set (TEDS)

The Treatment Episode Data Set (TEDS) yields information on the demographic and substance abuse characteristics of admissions to treatment of persons ages 12 and older for abuse of alcohol and/or drugs in facilities that report to individual State administrative data systems. Our state’s alcohol and drug information system, Tennessee Web-based Information Technology System, is

affectionately known as TN WITS (Personal communication, July 7, 2014). TEDS is not a measure of the number of individuals that have been admitted to treatment. Instead TEDS is an admission-based system. This means that persons who have been admitted three times within a calendar year would be counted as three admissions (SAMHSA/CBHSQ, 2013).

Demographic information is comprised of variables such as transaction type (i.e., whether admission; transfer, or discharge); type of service; whether the substance is a primary, secondary or tertiary problem; previous treatment history as well as the frequency of use, route of administration, and age of first use; and typical demographics such as age, ethnicity, race, employment, gender, and education. Substance problems can be reported for any of the following drugs at the primary, secondary, and/or tertiary level (SAMHSA/CBHSQ, 2013):

### 1. **Alcohol** (SAMHSA/CBHSQ, 2013)

Alcohol consumption is a leading culprit in mortality and morbidity related to both unintentional and intentional

(i.e., violence-related) injuries (Cherpitel, 2013).

Tennessee's drunk driving statistics provide data on persons in an alcohol-related

crash but not driving a motor vehicle at the time. In 2012, slightly better than one third

of fatalities involved alcohol-related crashes and nearly 85 percent of the crashes involved blood alcohol concentration levels at or greater than the legal limit (i.e., 0.08) (alcoholalert.com, n.d.).

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It has only been since the second half of the 20<sup>th</sup> century that the negative consequences of alcohol use during pregnancy have been known (Kvigne, Leonardson, Borzelleca, & Welty, 2008; Warren, Hewitt, & Thomas, 2011). In the late 19<sup>th</sup> century, physicians prescribed alcohol to reduce morning sickness and the difficulties of childbirth for pregnant women. By the 1940s, it was believed that alcohol use during pregnancy was not harmful to the fetus. Alcohol has also been used by physicians to delay the onset of labor (Kvigne et al., 2008). However, the detrimental effects of alcohol use during pregnancy are now known and all advisories warn against its use by pregnant women in any amount (CDC, 2005; Ismail, Buckley, Budacki, Jabbar, & Gallicano, 2010).

The cerebral cortex, hippocampus, and cerebellum are especially vulnerable to damage from alcohol abuse. This means possible damage to problem solving and decision-making, memory, and movement coordination (NIDA, 2010).

### 2. **Barbituates** such as phenobarbital, pentobarbital, secobarbital, amobarbital, etc. (SAMHSA/CBHSQ, 2013)

Barbituates are sedatives that can be helpful with sleep problems, anxiety, and some seizures. Not taking these medications as prescribed can lead to addiction. High doses can negatively impact your breathing, particularly if used when drinking alcohol (Smith, 2013).

3. **Benzodiazepines** include alprazolam, temazepam, triazolam, clonazepam, flunitrazepam, prazepam, oxazepam, diazepam, lorazepam, chlordiazepoxide, halazepam, flurazepam, clorazepate, and other unspecified benzodiazepines (SAMHSA/CBHSQ, 2013). Xanax (alprazolam) and valium (diazepam) are perhaps the two most well-known examples (Smith, 2013).
- Increases in emergency department visits were associated with non-medical use of alprazolam (SAMHSA, 2014).**

Non-medical use of alprazolam (Xanax) was associated with increases in emergency department (ED) visits from 2005 to 2010. While visits in 2011 remained stable, alprazolam was the most commonly prescribed psychiatric medication that year and the 13<sup>th</sup> most commonly sold medication in 2012 (SAMHSA, 2014). A good proportion of the ED visits involved a combination of alprazolam with another drug, often a pain reliever like oxycodone (SAMHSA/CBHSQ, 2013).

Alprazolam slows down movement of chemicals in the brain that may become unbalanced to reduce nervous tension, i.e., anxiety. The medication may be habit-forming and should never be purchased from vendors outside of the United States or on the Internet. There is evidence that medications distributed from the Internet may not be distributed by a licensed pharmacy and/or may contain dangerous ingredients. Tested samples of Internet-purchased alprazolam have been found to contain haloperidol (Haldol). In particular, persons with a history of drug/alcohol addiction, depression, or suicidal thoughts/behaviors should avoid taking alprazolam (Drugs.com, 2012).

#### 4. **Cocaine/crack** (SAMHSA/CBHSQ, 2013)

Referred to as the “wonder drug” in its early years of appeal in the United States, cocaine was originally freely available in saloons, from mail-order vendors, and even in grocery stores. It was often included in soda pop and some wines before its ill effects were known. President William Taft identified cocaine as “Public Enemy No. 1” and Congress, in 1914, passed the Harrison Act, tightly regulating the distribution and sale of the drug. Its appeal declined dramatically by the late 1950’s, but soon reappeared in the 1960’s (Das, 1993).

Because it is short-acting, cocaine can lead abusers to “binge”, i.e., to ingest the drug numerous times in a single session. Abuse can result in severe medical consequences related to the digestive system, respiratory system, nervous system, and the heart (NIDA, 2010).

## 5. Heroin (SAMHSA/CBHSQ, 2013)

A powerful opiate that produces feelings of relaxation and euphoria, it slows respiration. Its use has also been associated with increased risk of serious infectious diseases such as human immunodeficiency virus infection and acquired immune deficiency syndrome (HIV/AIDS) and hepatitis C, especially when taken intravenously (NIDA, 2010). U. S. physicians used opium as a therapeutic agent for multiple purposes, including to reduce spasms from tetanus. Heroin was synthesized from morphine in the late 1800's and produced commercially by a pharmaceutical company. The plan was for heroin to replace morphine use medicinally but it too was highly addictive and classified as an illegal drug (MethOIDE, n.d.)

Heroin use is on the increase, especially among prescription opioid users and young people. The drug is dangerously addictive, which increases overdose risk. Moreover, users have no control over the purity of the drug injected into their systems and/or its possible contamination with other drugs such as fentanyl. There are further reports that heroin laced with the elephant-tranquilizer carfentanil is being sold on the streets. Carfentanil is 10,000 times more potent than morphine and an analogue of fentanyl (Kounang & Marco, 2016). Thus, the heroin user can never be sure of the amount of active drug(s) being taken. Nationally heroin use has spread into the small towns and suburbs (Volkow, 2014).

## 6. Inhalants such as paint thinner, chloroform, ether, nitrous oxide, glue, gasoline, etc. (SAMHSA/CBHSQ, 2013).

These are volatile substances often found in a number of household products. They induce mind-altering effects and are extremely toxic. Inhalants can damage the brain, heart, lungs, and kidneys. Healthy persons can succumb to heart failure and death within minutes of even a single session of prolonged sniffing of an inhalant (NIDA, 2010).

## 7. Marijuana/hashish including THC as well as any other *cannabis sativa* preparations (SAMHSA/CBHSQ, 2013).

One of the most frequently abused illegal substances, marijuana impairs learning and short-term memory, coordination, and the ability to focus attention. It can also increase heart rate, harm the lungs, and exacerbate the risk of psychosis in persons with an underlying vulnerability (NIDA, 2010).

Both marijuana and hashish come from the Cannabis plant. Marijuana, often referred to as "weed", looks like a greenish herbal mixture. Hashish is typically smoked and has a very pungent, recognizable odor. The drug (hashish) is made from the resin of the plant, which is dried into blocks. The texture of hashish can range from dry and hard like a piece of fudge to moist and pliable like plasticine. Its appearance is so varied that novice users are commonly duped into purchasing licorice or other inexpensive, benign substances that look similar (Hartney, n.d.).

## 8. Methamphetamine (SAMHSA/CBHSQ, 2013)

Methamphetamine is the only illegal substance that can easily be concocted from ingredients that were legally obtained. On the street, it may be referenced as crank, black beauties, bikers' coffee, ice, or meth, among other names (ACOG, 2011; NIDA, 2013). Discovered in Japan in 1919, it could be injected but smoking methamphetamine created the same effects as injecting. In this country, it rose to popularity in California through motorcycle gangs. Today anyone who can read a recipe can manufacture it (Methamphetamines.com, 2013).

Methamphetamine is more potent than amphetamine, its parent compound, with a half-life around 12 hours compared to 60 minutes for cocaine, for

instance. It can be ingested orally or anally, injected, smoked, or snorted, but the injected or smoked high is more intense. Short-term, it is

Users of methamphetamine have elevated levels of psychiatric symptoms and psychological problems (Wright, Schuetter, Fombonne, Stephenson, & Haning III, 2012).

associated with increased energy and wakefulness as well as decreased appetite. Meth

used can result in hypertension, seizures, even risk of the human immunodeficiency virus (HIV) due to increased sexual activity. Addiction, confusion, memory loss, weight loss, "meth mouth" (severe dental problems), depression, and violent behavior have been linked to long-term use of methamphetamine (ACOG, 2011; NIDA, 2013).

The age of new methamphetamine users, on average, in 2012 was 20 years (NIDA, 2013). In general, users of methamphetamine have elevated levels of psychiatric symptoms and psychological problems (Wright, Schuetter, Fombonne, Stephenson, & Haning III, 2012).

## 9. Non-prescription methadone (SAMHSA/CBHSQ, 2013)

Non-prescription methadone involves using methadone inappropriately, a reality linked to one in three overdose deaths from prescription painkillers. Methadone is long-acting and can continue to circulate through a person's system after the pain-relieving effects have worn off. Methadone diversion might occur through individuals who have received take-home doses. The drug could end up in the hands of a current methadone client, thereby making his or her daily dosage higher than prescribed, or to someone else looking for a "high" (CNN, 2012).

## 10. Other amphetamines such as MDMA, phenmetrazine, amphetamines, and other unspecified amines and related drugs (SAMHSA/CBHSQ, 2013)

Amphetamines are powerful stimulants that can produce alertness and feelings of euphoria. MDMA, also known as ecstasy, produces mind-altering and stimulant effects. It can elevate body temperature, heart rate, blood pressure, and heart wall stress. Ecstasy may additionally be toxic to nerve cells (NIDA, 2010).

First synthesized in 1887 by Edeleanu, a Romanian chemist, amphetamines increase attention and wakefulness and decrease fatigue and appetite. Use may lead to aggressiveness, irritability, delusions of grandeur, superiority, paranoia, power, and psychosis with delusions and hallucinations. Withdrawal symptoms may include somnolence and profound fatigue, which can last for months in heavy and/or chronic users. Abstinence may be associated with suicidal ideation, agitation, and severe anxiety. Users of amphetamines rapidly develop dependence and tolerance. Chronic users may require 10 to 25 tablets in order to achieve effects similar to 2 to 3 tablets for novice users. Polydrug use is also a problem common among amphetamine-users. Reports from the United Nations show amphetamines as the second most commonly abused illegal drug in the world after cannabis, particularly in developing regions of the world (Oei et al., 2012).

Prognosis is bleak for users of amphetamines because many of them fail to perceive their drug of choice as a problem. Thus people who use amphetamines are not likely to engage or stay in treatment. They tend to self-detoxify with legal and illegal substances (Oei et al., 2012).

Prognosis is bleak for users of amphetamines because many fail to perceive their drug of choice as a problem (Oei et al., 2012).

Promising research using other stimulants as substitutes to reduce cravings and withdrawal symptoms, akin to the concept of methadone use for opioid dependence is on

the horizon. Users of amphetamines who were treated with modafinil, sought counseling, and did not use other agents demonstrated significant reductions in systolic blood pressure and weight gain. Some antidepressants (e.g., fluoxetine) are showing promise as well but tend to be effective when the user is a male who actively seeks intensive counseling (Oei et al., 2012).

11. **Other hallucinogens** including DMT, STP, LSD, mescaline, peyote, hallucinogens, psilocybin, etc. (SAMHSA/CBHSQ, 2013)

LSD is one of the most potent of the perception-altering drugs of abuse in the United States. Its effects are unpredictable and abusers may “see” vivid images and colors, feel sensations, and hear sounds that seem real but are really nonexistent. Sometimes abusers have traumatic experiences and emotions that last for several hours. Short-term effects might include loss of appetite; sleeplessness; dry mouth; tremors; and increased body temperature, blood pressure, and heart rate (NIDA, 2010).

12. **Other non-barbiturate sedatives or hypnotics** such as ethchlorvynol, methaqualone, chloral hydrate, glutethimide, etc. (SAMHSA/CBHSQ, 2013)

These drugs were developed in the 1950s and later, designed to replace barbiturates in many areas of non-medical and medical use. Most of these sedatives were introduced as “non-barbiturates” to indicate their distinction with barbiturates. However, these “newer” sedatives showed to be much more like barbiturates than was originally realized (Drugtext.org, 2011).

13. **Other non-benzodiazepine tranquilizers**, for example, ambien, lunesta, etc. (SAMHSA/CBHSQ, 2013)

Non-benzodiazepines are sleep medications that are also known as “Z-drugs”. First produced in the late 1980s, they tended to have fewer side effects than benzodiazepines. These medications are potentially addictive and usually prescribed for only a short term, one week to 10 days, but definitely not longer than four weeks (Harding, 2014).

14. **Other opiates and synthetics** including codeine tramadol, meperidine, oxycodone, buprenorphine, hydrocodone, hydromorphone, pentazocine, opium, propoxyphene, morphine, and any other drugs with morphine-like effects (SAMHSA/CBHSQ, 2013)

Opioid drugs such as OxyContin, morphine, and Vicodin, have legitimate medical uses. However their nonmedical use and/or abuse can result in the same harmful consequences as abusing heroin (NIDA, 2010).

In the nineteenth century, pain relievers such as morphine and heroin were deemed as helpful in everyday life. However, people were not initially aware of the adverse effects associated with these and similar substances, especially the abuse potential (Musto, 1991). Over the past several decades, however, flexibility in laws governing the prescribing of opioids for the treatment of chronic non-cancer pain is said to have caused the dramatic increases in opioid use. Moreover, opioid analgesics are now responsible for more deaths than the number of deaths from heroin and cocaine combined or from both motor vehicle crashes and suicide (Manchikanti et al., 2012).

In May 2015, the Tennessee Bureau of Investigation (TBI) issued a warning about the opiate fentanyl being sold online as oxycodone. The pills looked like 33 mg Oxycodone, were the same size, and also featured with the signature A/215 stamp characteristic of oxycodone. However, these pills contained fentanyl, a pain killer that is 50 times more potent than heroin which can be deadly in high doses. The pills had been purchased from an online pharmacy and sold as oxycodone. TBI advised individuals with legitimate need for prescription pain relievers to obtain their medications through a licensed pharmacy and to avoid online purchase of prescription medicines. The TBI indicated that online purchases, while convenient, are not a safe alternative because there is no assurance regarding the quality or the actual ingredients (WRCB Staff, 2015).

15. **Other stimulants**, for example, methylphenidate (SAMHSA/CBHSQ, 2013).

Methylphenidate continues to be the most commonly prescribed medication for ADHD in young people around the world (Karla, et al., 2010).

16. **Over-the-counter medications** such as cough syrup, aspirin, sleep aids, diphenhydramine and other antihistamines, and any other legally obtained nonprescription medication (SAMHSA/CBHSQ, 2013)

17. **Phencyclidine (PCP)** (SAMHSA/CBHSQ, 2013)

Originally developed as an intravenous anesthetic, its medical use was discontinued due to the side effects of delirium and confusion. On the “black” market, the drug contains a number of contaminants that change its pure form in color and consistency. The liquid form is most frequently dissolved in ether. Phencyclidine is generally sprayed onto leafy material such as parsley, oregano, mint, or marijuana for smoking. Among its street names on the black market include Hog, Wick, Rocket Fuel, Embalming Fluid, Lovely, and Angel Dust (Drugs.com, 2014a).

18. **Other** includes substances such as GHB/GBL, diphenylhydantoin/phenytoin, ketamine, etc. (SAMHSA/CBHSQ, 2013).

Medications in this category might be used for a variety of purposes, many legitimate. For example, GHB or gamma Hydroxybutric acid was approved for medical use in the treatment of particular sleep disorders. The “street” version, however, is used for its euphoria and relaxation properties. In its typical liquid form, the drug is mixed with alcohol (NIDA InfoFacts, n.d.). Like ecstasy, GHB is very popular with club-goers and individuals that frequent “rave parties” (Gavin, 2014).

Diphenylhydantoin/phenytoin is used to prevent and control seizures. These medications reduce the spread of seizure activity in the brain. Sometimes they may be referred to as antiepileptic or anticonvulsant drugs (Web MD, n.d.). Ketamine, on the other hand, is an anesthetic that works to inhibit painful sensations in the brain. It is recommended that a responsible adult monitor and assist individuals receiving ketamine for up to 24 hours (Drugs.com, 2014b).

Many prescription medications that are increasingly being abused and/or used for nonmedical purposes are covered across various drug categories in TEDS. Among the most commonly abused classes include painkillers, sedatives, and stimulants. Disturbing aspects include the increased prevalence of teenagers and young adults in abuse of these medications, as well as the misperception that they are safe to take because they were prescribed by physicians. This misconception holds even when prescription medications are used illegally (NIDA, 2010).

## **WHO MAY HAVE A Substance Use Disorder (SUD)?**

Substance use constitutes one of this country’s most challenging problems. It is an equal opportunity destroyer, affecting individuals from all income levels, geographic areas, racial groups and ethnicities, ages, and genders (NIDA, n.d.). Males and females can have substance use disorders. Substance use disorders can affect persons with mental health disorders as well as individuals without such disorders. People living in the South, North, East, or West can have a SUD. Individuals below the age of 18 years, between 18 and 64 years of age, or 65 years of age and over can have a substance use disorder (SUD). Substance use disorders (SUDs) can affect anyone of any racial or ethnic group. Individuals from low-, middle-, and high-income families can have a SUD. Professional and nonprofessional people can have a SUD. Substance use disorders (SUDs) can affect individuals from all walks of life. Substance use does not discriminate. It intersects with,

and contributes to, many of the challenges that we face as a state and a nation, including poverty, mental illness, school failure, criminal activity, and a number of health problems (Zobeck, 2014).

Besides people themselves having a SUD, many individuals have family and/or friends that have a substance use disorder (SUD). There are individuals who reside in communities where substance issues are very problematic. Substance use issues are more prevalent than many people think and not just a problem of the poor and marginalized. A host of other factors besides poverty play into substance use (National Poverty Center, 2004).

Combined 2008 to 2012 National Survey on Drug Use and Health (NSDUH) data showed that people with employment can have a substance use disorder (SUD). Per that data set, slightly more than half the adults (i.e., ages 18 to 64) with SUDs had full-time employment. However, substance use appeared to, in part, be a function of whether employers had written substance use policies. For example, full-time adult workers that used substances were more likely to work for an employer with no written policy about employee substance use. Female workers were more likely to report working for an employer that provided substance use policies and programs than males. However, male workers were more likely to indicate receiving educational information from their employer (SAMHSA/CBHSQ, 2014).

## **Does Substance Use Disorder involve Drugs or Narcotics?**

Drugs are substances intended for use in the diagnosis, mitigation, prevention or cure of disease in animals or humans, and any substances other than water, food, or oxygen that are intended to influence the body or mental function of animals or humans. Scientists define drugs as substances that influence neurological or biological states in humans or animals. Therefore, drugs can be synthetic, such as sedatives or amphetamines, or organic, such as tetrahydrocannabinol (THC) found naturally in marijuana. They can be swallowed, smoked, taken as a suppository, applied to the skin, inhaled through the nostrils, or injected with a needle. By statute, narcotics have been defined as drugs that dull the senses and frequently become addictive after prolonged use (TheFreeDictionary, n.d.).

Federal and state laws in this country commonly distinguish narcotics from drugs. Thus, they are regulated through the United States Food and Drug Administration (FDA). In the legal system, the term narcotics refers to illegal drugs that have a high potential for abuse (Knouff, n.d.). The Feds and most states use a classification system to control the use of dangerous drugs. This system consists of schedules which include both illicit and harmful legal drugs (TheFreeDictionary, n.d.).

Drugs considered controlled substances under the Controlled Substances Act (CSA) are divided into five schedules at the Federal level. Lower numbered schedules are considered the most dangerous drugs while schedules carrying higher numbers are considered to be the least dangerous (CriminalDefenseLawyer.com, n.d.; LawUpdater.com, 2016). Placement in a schedule is based on whether the drugs have currently accepted medical use in treatment in the United States, their relative abuse potential, and their likelihood of causing dependence when abused. Definitions of each schedule and example substances are listed below (DOJ/DEA/ODC, n.d.).

## **Controlled Substance Schedules – Federal.**

### **Schedule I**

- Substances have no accepted medical use in the United States currently, lack accepted safety for use under medical supervision, and have high potential for abuse.
- Examples of substances include, but are not limited to, heroin, lysergic acid diethylamide (LSD), 3,4-methylenedioxymethamphetamine ("Ecstasy"), and marijuana (cannabis) (DOJ/DEA/ODC, n.d.).

### **Schedule II/IIN (2/2N)**

- These substances have high potential for abuse that may lead to severe physical or psychological dependence.
- Substance examples include, but are not limited to, hydromorphone (Dilaudid®), oxycodone (OxyContin®, Percocet®), meperidine (Demerol®), methadone (Dolophine®), and fentanyl (Sublimaze®, Duragesic®). Hydrocodone, morphine, and codeine are examples of other Schedule 2 narcotics. Schedule 2N stimulants include, but are not limited to, methylphenidate (Ritalin®) and amphetamine (Dexedrine®, Adderall®). Pentobarbital is an example of other Schedule II substances (DOJ/DEA/ODC, n.d.).

### **Schedule III/IIIN (3/3N)**

- The potential for abuse for substances in this schedule are less than substances in Schedules I or II but abuse may lead to high psychological dependence or low to moderate physical dependence.
- Schedule III narcotics examples include, but are not limited to, buprenorphine (Suboxone®) and products containing not more than 90 milligrams of codeine per dosage unit (Tylenol with Codeine®). Schedule IIIN non-narcotics include, but are not limited to, anabolic steroids such as Depo®-Testosterone, e.g. (DOJ/DEA/ODC, n.d.).

### **Schedule IV**

- These substances have a lower potential for abuse relative to substances in Schedule III.
- Schedule IV substances include, but may not be limited to, alprazolam (Xanax®), diazepam (Valium®), lorazepam (Ativan®), carisoprodol (Soma®), tramadol (Ultram®) and triazolam (Halcion®) (DEA/OD/ODE, 2014; DOJ/DEA/ODC, n.d.).

## Schedule V

- Substances in this schedule consist primarily of preparations containing limited quantities of certain narcotics and have a low potential for abuse relative to substances listed in Schedule IV.
- Schedule V examples include, but may not be limited to, cough preparations that contain no more than 200 milligrams of codeine per 100 milliliters or per 100 grams (Robitussin AC®, Phenergan with Codeine®) (DOJ/DEA/ODC, n.d.).

## **Degrees of Substance Use/Helpful Tips**

There are people who drink alcohol every day and swear they can quit any time they want to. Is this a person who is still in control of his/her substance use or is it an excuse? What about people who use drugs other than or in addition to alcohol recreationally on a daily basis? Where do they fit? Do they have a problem? The four degrees of drug use indicated below may provide helpful common sense distinctions about whether help should be considered.

## **1. Experimentation All Alone**

This may be the first way that individuals enter into drug use. Sometimes the individual is curious about a particular drug's effects. Some persons succumb to the pressures of others. While seemingly a harmless entry into substance use, one use can result in harm, especially when the individual makes poor decisions under the influence such as drinking and driving, e.g. For an individual who is predisposed to addiction, one use can set into motion a pattern of substance abuse and dependency.

## **2. Social Use**

The social substance user consumes substances in social situations, generally to fit in, relax, or have fun. Again, though seemingly innocent compared to the solitary substance use, social use more often than not leads to greater degrees of substance use. It is very possible for the social user to cross the line into substance abuse if he or she continues to use even in the face of negative consequences.

## **3. Binge Use**

This use is often associated with drinking but can also apply to use of other substances. It involves periodic use that might be categorized as heavy use. Bingeing may encompass only one to two days of substance use per week but in excessive amounts. Such use establishes a problematic pattern. Lots of bad things happen when individuals choose to binge.

## **4. Substance Abuse and Addiction**

Whether the use is referenced as abuse, dependence or addiction, substance use that interferes with work, health, relationships, career, finances, or other areas of life, it poses a significant problem. Additional signs of addiction include:

- Trying to control the substance use unsuccessfully
- Using substances in dangerous situations (e.g., before driving)
- Spending a great deal of time finding, using and recovering from the effects of substances
- Withdrawing from family and friends or giving up other activities to use substances
- Needing more of a substance to get the same high (i.e., tolerance)
- Experiencing withdrawal symptoms when trying to quit (Sack, 2014)

Substance use can become all-consuming and difficult to overcome, even with help.

- ✓ Even with medication assistance, only 20 to 50 percent of people with SUDs remain abstinent during the first year of treatment (Khodabandeh, Kahani, Shadia, & Abdollahi, 2012).

- ✓ Between 2007 and 2010, slightly more than 12 percent of people seeking treatment for alcohol or illicit drug abuse were deterred because they were concerned that the community would view them in a negative light (Recovery Month, 2014).
- ✓ Relapse is an unavoidable phenomenon in the course of substance use treatment (Khodabandeh et al., 2012).

# Addiction

## What Is Addiction?

Use of substances can lead to addiction. The word “addiction” comes from the Latin word “addicere”, which means enslaved by or bound to. As originally used, the word was not linked to substance use behaviors. Instead, it was first associated with excessive alcohol use. It was not until the 1980s that the word “addiction” became linked almost exclusively to excessive patterns of substance use (Ries, Fiellin, Miller, & Saitz, 2009).

Gregory Amer, a physician at the University of Minnesota Medical Center, Fairview, described addiction in the following way: ‘the disease of addiction is never cured, it never goes away – the “pilot light always stays on”’ (MDHS, 2013, p.14). The American Society of Addiction Medicine’s (ASAM’s) definition is more scientific but consistent with Amer’s description. ASAM defines addiction as “a primary, chronic disease of brain reward, motivation, memory, and related circuitry” (ASAM, 2013, p. 10). Any dysfunction in the circuitry will lead to social, biological, spiritual, and psychological manifestations that are reflected in a person’s pathologically pursuing relief and/or reward by substance use and other behaviors. The person will not be able to consistently abstain; demonstrate impairment in craving, diminished recognition of interpersonal relationships, and behavioral control; and exhibit dysfunctional emotional response (ASAM, 2013). In short, it is loss of control over substance use (Nestler, 2009). Thus, an individual with such characteristics is considered to be in active addiction (MDHS, 2013). Addiction usually occurs through misuse as opposed to proper use of medication (SAMHSA/CSAT, 2011). As true for other chronic diseases,

addiction will include cycles of relapse and remission. Failure to provide treatment and/or encourage engagement in recovery activities may result in disability or premature death (ASAM, 2013).

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(SAMHSA/CSAT, 2011).

Addiction involves the compulsion to seek and use drugs, a loss of control over how the drugs are used, and the emergence of a negative emotional state (Koob, 2013;

NIDA, 2016). Per the ASAM definition, features include:

- An inability to consistently **A**bstain
- Any impairment in **B**ehavioral control
- **C**raving or more “hunger” for substances or rewarding experiences
- **D**iminished recognition of significant problems in the individual’s interpersonal relationships and behaviors
- A dysfunctional **E**motional response (ASAM, 2013).

**D**rug addiction is a complex disease (NIDA, 2012). It affects both the brain and behavior. Years of research has continued to demonstrate that the condition is treatable (NIDA, 2010). Substances including alcohol and nicotine tap into the brain's communication system and interfere with the way the nerve cells normally send, receive, and process information. Some drugs, such as heroin and marijuana, have a chemical structure that actually mimics the natural neurotransmitter. However, the messages being transmitted through the network are abnormal. Other drugs, such as cocaine and amphetamines, cause the release of an abnormal number of natural neurotransmitters or prevent the normal recycling of brain chemicals, ultimately disrupting the communication channels. Most drugs indirectly or directly work on the brain's reward system and flood the circuit with dopamine. (Dopamine is a neurotransmitter that regulates movement, cognition, motivation, emotion, and feelings of pleasure.) Drugs can release two to ten times the amount of dopamine that natural rewards do. Thus, it is the overstimulation of this system that produces the euphoric effects sought by individuals who abuse drugs and leads them to repeat the behavior (NIDA, 2010).

To adjust to the overwhelming surges of dopamine, the brain produces less dopamine or reduces the number of receptors that can receive signals. This may leave the reward circuit of

Drugs can release two to ten times the amount of dopamine that natural rewards do (NIDA, 2010).

the substance abuser abnormally low and the ability to experience pleasure weakened. Hence, the development of tolerance or the taking of larger and larger amounts of the drug by the substance abuser than at the first creation of the dopamine high, just to try to bring their dopamine function back up to normal levels. Of course, the development of tolerance can eventually lead to severe changes in neurons and brain circuits. Chronic exposure to drugs of abuse, as in addiction, erodes an individual's self-control and ability to make sound decisions while sending intense impulses to take drugs (NIDA, 2010).

## Drug Combinations

Unfortunately many substances of abuse are used in combination, which is a particularly dangerous practice. It could involve the co-administration of two legal drugs, e.g., nicotine and alcohol; the random mixing of prescription drugs; and/or the deadly combination of cocaine or heroin with fentanyl. Regardless the context, such practices are extremely harmful and pose significantly higher risks than the already harmful consequences associated with use/dependence on a single drug (NIDA, 2010).

## Myths about Drug Abuse and Addiction

*Myth 1: Overcoming addiction is simply a matter of willpower. You can stop using drugs if you really want to.* Prolonged exposure to drugs alters the brain in ways that result in powerful cravings and a compulsion to use. These brain changes make it extremely difficult to quit by sheer force of will.

**Myth 2: Addiction is a disease; there's nothing you can do about it.** Most experts agree that addiction is a brain disease, but that doesn't mean you're a helpless victim. The brain changes associated with addiction can be treated and reversed through therapy, medication, exercise, and other treatments.

**Myth 3: Addicts have to hit rock bottom before they can get better.** Recovery can begin at any point in the addiction process—and the earlier, the better. The longer drug abuse continues, the stronger the addiction becomes and the harder it is to treat. Don't wait to intervene until the addict has lost it all.

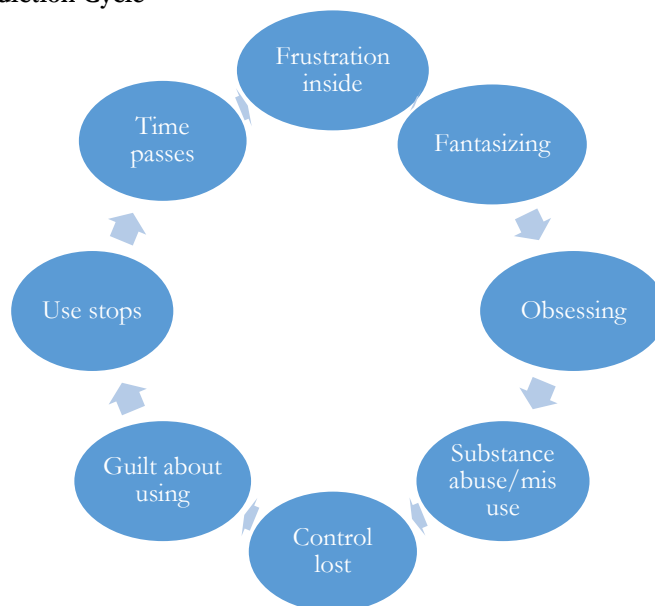
**Myth 4: You can't force someone into treatment; they have to want help.** Treatment doesn't have to be voluntary to be successful. People who are pressured into treatment by their family, employer, or the legal system are just as likely to benefit as those who choose to enter treatment on their own. As they sober up and their thinking clears, many formerly resistant addicts decide they want to change.

**Myth 5: Treatment didn't work before, so there's no point trying again.** Recovery from drug addiction is a long process that often involves setbacks. Relapse doesn't mean that treatment has failed or that you're a lost cause. Rather, it's a signal to get back on track, either by going back to treatment or adjusting the treatment approach. (Robinson, Smith, & Saison, 2014)

## The Addiction Cycle

A number of sources identify an eight-step cycle of addiction. Persons who are addicted to substances may go through the phases repeatedly before eventually taking a step toward recovery (Treatment4Addiction.com, 2011).

Figure 1. Addiction Cycle



Source: Adapted from Treatment4Addiction.com, 2011.

Phase 1 involves feelings of frustration or some kind of mental anguish that leads to depression or anxiety and triggers craving for drug use. Entering this phase may be the result of a mental disorder or the occurrence of some stressful event such as a relationship that grows apart or the death of a loved one. The second phase involves fantasizing about substance use. The person who is addicted will consider using drugs and fantasize about the use. Most often, the individual does not speak openly about these thoughts (Treatment4Addiction.com, 2011).

The fantasizing typically evokes obsessions, the third phase of addiction. The fantasies grow, thus making the thought of use nearly constant. Sometimes the obsessions are accompanied by a sense of impending doom and the person now comes to terms with the idea of using again. Phase 4 involves actual addictive activity, i.e., actual drug use (Treatment4Addiction.com, 2011).

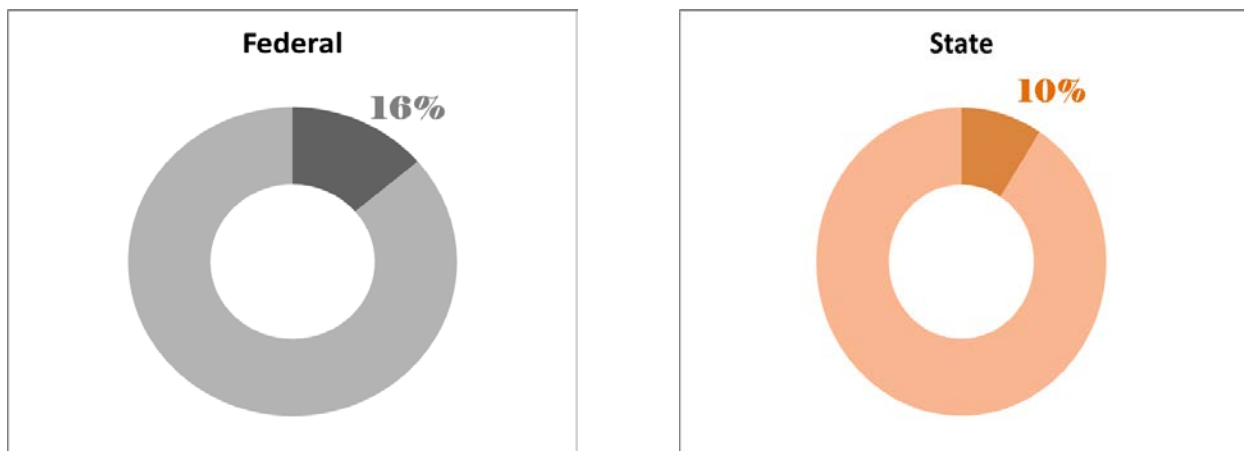
Once the drug use starts to spiral out of control for the individual such that the addictive activity has control of his/her life, the fifth phase of powerlessness commences. The person uses drugs at inappropriate times, whether or not he or she does not really want to. In this phase, the individual may feel completely incapable of abstinence for even a relatively short period of time (Treatment4Addiction.com, 2011).

The chaos that has resulted from the loss of control leads to feelings of guilt, shame, or remorse, the sixth phase. The person may feel very regretful about the decision to use substances again and may be too embarrassed to let anyone know about these insecurities. The self-image has been negatively affected and a sense of dissatisfaction for life is also noted for most people in this phase (Treatment4Addiction.com, 2011).

In Phase 7, the individual begins to make resolutions to end the behavior. This phase may involve promises to self or others that will soon end. It may further incorporate a vow to end substance use forever. Drug paraphernalia may even be disposed of. Substance use may abruptly end for a period of time, but without a proper recovery plan that is put into action, the individual will move into the eighth phase, which starts the cycle all over again. Phase 8 often results in the person forgetting the chain of events that occurred during the last relapse. Thus, there is significant mental pain associated with this phase (Treatment4Addiction.com, 2011).

## Cost of Addiction

Figure 2. Percent of Budgets Spent on Addiction/Substance Use



Source: NCAS, 2015.

According to the National Center on Addiction and Substance Abuse (NCAS) (2015), addiction and substance use spending consumes 10 percent of the federal budget and 16 percent of state budgets. The **health care system** receives the largest share of spending from consequences of addiction and substance use. Substances, including alcohol and tobacco, cause or contribute to more than 70 other conditions requiring medical care such as heart disease, lung disease, cancer, HIV/AIDS, cirrhosis, pregnancy complications, ulcers, and trauma.

**Adult/juvenile corrections and the courts** get the second largest share of federal and state spending related to addiction/substance use. Data indicate that 85 percent of inmates in the adult corrections system are substance involved and almost two thirds have a history of substance use problems. Of the young people that enter the juvenile justice system, 78 percent are substance involved and 44 percent meet clinical diagnosis for substance use problems (NCAS, 2015).

The third largest recipient of government spending from consequences of addiction/substance use is the **educational system**. Substance use negatively affects the learning environment and academic performance. It increases the chances that the young person will drop out of school or fail to attend college and or not obtain a college degree (NCAS, 2015).

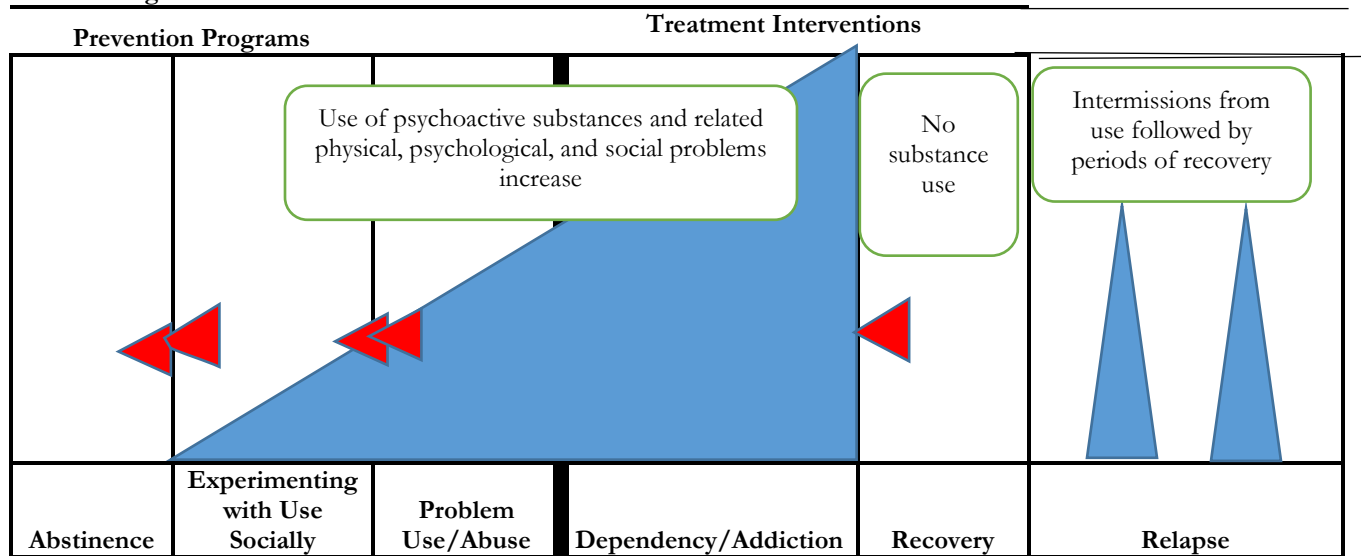
Consequences of addiction/substance use also mean spending on **public safety** and **workforces**. States have to invest in highway patrol, local law-enforcement programs and highway-safety, special drug enforcement programs, as well as accident-prevention programs to keep the public safe. Moreover, addiction/substance use compromises workforce productivity and increases the cost of doing business. Besides affecting personal job performance, substance use impacts co-workers/the success of the company. Co-workers, for example, report having been injured or almost injured or covering for another employee's substance use. Addiction/substance use places a burden on **many other governmental services**, including mental health, child welfare, developmental disabilities, food and nutrition assistance, and housing and employment assistance (NCAS, 2015).

## Model of Care – Traditional versus Chronic Disease Model

Addiction cannot be cured  
(SAMHSA/CSAT, 2011).

The traditional acute care model of substance use treatment has encouraged the public to expect that persons entering addiction treatment will be cured and able to maintain lifelong abstinence following a single episode of specialized treatment (MDHS, 2013; White, Boyle, & Loveland, 2003). **However, addiction cannot be cured.** It can be treated with medication, counseling, and/or support from family and friends (SAMHSA/CSAT, 2011).

**Figure 3. Process of Addiction**



Source: Adapted from Crowe & Reeves, 1994.

The figure above provides a graphic representation of the progression of substance use through three states of experimental/social use, problem use/abuse, and dependency/addiction. Related physical, psychological, and social problems increase as use progresses through the stages. Many individuals are able to manage their substance use during earlier stages and may move back and forth from abstinence to problem use. Many professionals contend that individuals who reach the stage of dependency/addiction have acquired a chronic, relapsing disorder for which there is no cure. It is hypothesized that, at this point, the individual cannot return to earlier stages of controlled use without help (Crowe & Reeves, 1994).

Treatment becomes necessary to help individuals addicted to substances enter a stage of recovery during which they can abstain from substance use and engage in improved physical, psychological, and social functioning (Crowe & Reeves, 1994).

## Determining If You May Be Addicted to Substances

There are confidential screening tools online, as well as in this document, to help you determine if you may need to seek help for a substance use problem. You might also read and honestly respond to the questions below. Written by persons addicted to substances that were participants in Narcotics Anonymous (NA), the results may help you remove doubts about whether your substance-using behaviors signal addiction. Consider further evaluation and/or seeking help from a professional knowledgeable in the area of substance use if you respond “Yes” to some of the questions (about.com, 2014).

- Do you avoid people or places that do not approve of you using drugs?
- Do you continue to use despite negative consequences?
- Do you ever question your own sanity?

- Do you ever use alone?
- Do you feel it is impossible for you to live without drugs?
- Do you put the purchase of drugs ahead of your financial responsibilities?
- Do you regularly use a drug when you wake up or when you go to bed?
- Do you think a lot about drugs?
- Do you think you might have a drug problem?
- Does the thought of running out of drugs terrify you?
- Does using interfere with your sleeping or eating?
- Has using affected your sexual relationships?
- Has your job or school performance ever suffered from the effects of your drug use?
- Have you ever been arrested as a result of using drugs?
- Have you ever been in a jail, hospital, or drug rehabilitation center because of your using?
- Have you ever felt defensive, guilty, or ashamed about your using?
- Have you ever lied about what or how much you use?
- Have you ever manipulated or lied to a doctor to obtain prescription drugs?
- Have you ever overdosed on any drugs?
- Have you ever stolen drugs or stolen to obtain drugs?
- Have you ever substituted one drug for another, thinking that one particular drug was the problem?
- Have you ever taken drugs you didn't prefer?
- Have you ever taken one drug to overcome the effects of another?
- Have you ever thought you couldn't fit in or have a good time without drugs?
- Have you ever tried to stop or control your using?

- Have you ever used a drug without knowing what it was or what it would do to you?
- Have you ever used drugs because of emotional pain or stress?
- Have you had irrational or indefinable fears?
- Is your drug use making life at home unhappy? (about.com, 2014)

## Treatment

There are a number of treatments available to help individuals counter the power of addiction's disruptive effects. Research has shown that the combination of addiction treatment medications with behavioral therapy is the best way to ensure success for most individuals addicted to substances. This document provides detailed information on evidence-based (EB) medication-assisted treatments and psychosocial therapies such as behavior therapy as aids to clinicians and others that may be interested in education and information on the topic. It is recommended that treatment approaches be tailored to each individual's drug use patterns and co-occurring psychiatric, medical, and social problems, if evident, to effect sustained recovery and a life with substance abuse (NIDA, 2012).

Treatment for addiction must help a person stop using drugs, stay drug-free, and be productive in his or her family, work, and society. Therefore, effective treatment programs must be based on the following key principles:

- Addiction is a treatable disease that affects brain function and behavior, despite being complex.
- There is no single treatment that is right for everyone.
- People need to have quick access to treatment.
- All of a patient's needs, not just his or her drug use, must be addressed for treatment to be effective.
- Medications are an important part of treatment, especially when used in combination with behavioral therapies.
- Treatment plans must be reviewed often and adapted to align with the patient's changing needs.
- Treatment should address other possible mental disorders.
- Medically assisted withdrawal management is only the first stage of treatment.
- Treatment does not need to be voluntary for it to be effective.

- Drug use during treatment must be monitored on a continual basis.
- Treatment programs should test patients for tuberculosis, hepatitis B and C, HIV/AIDS, and other infectious diseases and teach them steps they can take to reduce their risk of such illnesses (NIDA, 2016).

Unfortunately, many individuals with substance use disorders (SUDs) may not seek treatment. Data from the 2012 National Survey on Drug Use and Health indicate that only about 11 percent of persons who need substance abuse treatment actually receive it (SAMHSA, 2014). Some persons are in denial about their substance use problem. Others believe that they should be able to work through their substance use problem without help. Then there are individuals who carry shame or fear about accessing treatment, potential physical withdrawal from substance use, and/or failure to recover. Additionally there is the fear of what family, friends, and/or employers might think if they seek treatment (MDHS, 2013).

## **Final Comments**

Not all individuals that use substances, whether alcohol or other drugs, become addicted. In fact, researchers say that risk of addiction is influenced by a myriad of factors, including biology, age, stage of development, and social environment. Individuals who have more risk factors have the greatest chance of moving into addiction with their substance use (NIDA, 2012). Persons addicted to specific substances also need to be careful about developing tolerance for substances of the same class, even those to which the body has not yet been exposed (TheFreeDictionary, n.d.). Such cross-tolerance can be exhibited by cigarette smokers to caffeine, e.g., where they experience a lower sensitivity to caffeine's stimulant effects than nonsmokers (SoberPlace, 2009).

# Prevention

Prevention can be defined as any activity designed to avoid substance use and/or abuse and reduce its social and health consequences. Actions may be aimed at reducing demand as shown in health promotions, e.g., and/or reducing supply, for instance, making substances less available (Medina-Mora, 2005).

**Preventive factors seek to enhance protective factors and/or reduce risk factors (Kane & Ballue, 2013).**

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Risk factors increase the likelihood of high-risk

behaviors, which often result in negative outcomes. Protective factors, on the other hand, lower the probability of high-risk behaviors and promote positive outcomes (Butler Center for Research, 2010).

Prevention is critical in the reduction of negative impact and outcomes associated with substance use and abuse and messages have become one of the most effective prevention interventions. It has been shown that consistent, pervasive messages to young people about substances can prevent substance use and/or abuse. In fact, effective prevention not only routinely repeats the same messages, but it is further delivered by multiple messengers—peers, parents, schools, and the community (Butler Center for Research, 2010).

The primary goal of prevention is to delay or prevent the onset of substance use and/or abuse. Delay alone is important. Research indicates youth that begin using substances prior to age 14 are significantly more likely to become substance dependent at some point in their lives (Butler Center for Research, 2010; CAPT, 2012). Thus, the prevention messages are paramount. Protective factors such as strong family bonds and proactive parenting additionally increase the probability that substance use/abuse will be delayed (Butler Center for Research, 2010).

In practice, there are essentially five models of substance abuse prevention, each based on a different set of underlying assumptions about behaviors of substance abuse and their motivations (Duncan & Gold, 1982).

First, there is the law enforcement model. Prohibition laws played a substantial role along with the threat or infliction of punishment to prevent substance abuse. This model was based on the assumption that substance abuse was moral issue and that people who abused substances must be punished for their own good, not to mention the good of society. Also inherent in this model is the fact that certain substances are inherently evil or at least too potent for people to be allowed to use. Hence, only the threat of punishment could keep people from being tempted to experiment with substances and become hopelessly addicted. This model has not been successful. Actually prohibition of substances resulted in more substance abuse and more crime, along with a growth in a substance-rich black market (Duncan & Gold, 1982).

The medical model is the second model. This model treats substance abuse as if it were an infectious epidemic. It relies on early identification and isolation of people who abuse substances before they can infect others. The model incorporates charts and pamphlets that tell parents and teachers how to identify substance-using/abusing teens. Strategies might consist of having parents search their teen's rooms for substances or to allow strip search of school lockers when there is

adequate suspicion. Jails are replaced by involuntary treatment. Like the law enforcement model, neither has the medical model been successful. It has also been mentioned that users of substances labeled as such through this model might become a self-fulfilling prophecy and live up to the expectations engendered by the label (Duncan & Gold, 1982).

The third model is the educational model. This model assumes that substance abuse results from poor choices made in ignorance of the hazards and effects of substances. Thus, it is anticipated that educating people about the dangers of substance abuse will assist them in making the right decisions and avoid substance abuse. Scare tactics as well as skill-building are applications of this model. Unfortunately substance education has not been the great success story either, especially not for young people (Duncan & Gold, 1982).

Fourth is the psychosocial model. Substances are used as a means of coping with day-to-day frustrations and problems. Prevention then needs to provide opportunities to deal with those issues. Strategies for preventing substance use might include peer counseling, crisis hotlines, transcendental meditation <sup>TM</sup>, and the like. Activities such as adventure and self-expression are also great alternatives to using substances based on this model (Duncan & Gold, 1982).

The fifth and final model is the sociocultural model. Here the focus is the root of substance abuse in the country, not in the individual person. The solution then is in changing communities, society, not in changing the individual. Societies that discriminate against the marginalized (e.g., ethnic minorities) should not expect to escape substance abuse. Societies that look the other way given gender discrimination, e.g., will not be able to prevent substance use/misuse. Societies that advertise pills as solutions to problems will find its youth turning to illicit substances for solutions (Duncan & Gold, 1982).

The Office of National Drug Control Policy [ONDCP] Web site (n.d.) recognizes the value of prevention efforts and promotes such approaches as the most cost-effective, common-sense ways to encourage healthy and safe communities. Research continues to show the relationship between substance use and poorer academic performance, lost productivity, traffic-crash deaths, sexually transmitted infections (STI), hepatitis C, human papillomavirus (HPV), etc. Substance use further contributes to rates of human immunodeficiency virus (HIV) transmission and puts children at risk for abuse and neglect. Preventing substance use and dependence before it ever begins can help save lives and reduce costs related to health care and criminal justice.

## Prevention Principles

There are 16 principles of

prevention. They have been revised based on research funded by the National Institute on Drug Abuse (NIDA) as well as the core elements observed in research on effective prevention programs (NIDA, 2003). The principles dictate that prevention programs:

**There are 16 prevention principles (NIDA, 2003).**

1. Should reverse or reduce risk factors while enhancing protective factors
2. Should address all forms of substance use and/or abuse, in combination or alone, including the underage use of legal substances (e.g., alcohol or tobacco); the use of illicit drugs (e.g.,

heroin or marijuana); and the inappropriate use of prescription medications, substances legally obtained (e.g., inhalants), or over-the-counter drugs.

3. Should speak to the type of substance abuse problem in the local community, strengthen identified protective factors, and target risk factors that can be modified.
4. Should be tailored to address risks to audience characteristics or specific populations, such as gender, ethnicity, and age to improve program effectiveness.
5. If family based, should improve family relationships including bonding and incorporate practice in developing, discussing, and enforcing family policies on substance abuse; training in substance information and education; and parenting skills.
6. Might be designed to intervene as early as preschool to address risk factors for substance use and/or abuse, such as poor social skills, aggressive behavior, and academic difficulties.
7. If designed for elementary school children, should target improvement of social-emotional and academic learning to address risk factors for substance abuse, such as academic failure, early aggression, and school dropout. The educational component should focus on the following:
  - academic support, especially in reading;
  - communication;
  - emotional awareness;
  - self-control; and
  - social problem-solving.
8. If designed for middle school/junior high or high school students, should enhance academic and social competence with the following :
  - communication;
  - substance resistance skills;
    - reinforcement of antidrug attitudes; and
    - strengthening of personal commitments against substance abuse.
  - peer relationships;
  - self-efficacy and assertiveness; and
  - study habits and academic support.
9. If aimed at the general public at key transition points, such as transition from elementary school to middle school, can produce beneficial effects even among high-risk children and

families. These types of interventions do not single out risk populations and thus reduce labeling and increase bonding to school and community.

10. If community based and a combination of at least two effective programs, they can be more effective than a single program alone.
11. If community based and focused on populations in multiple settings, e.g., faith-based organizations, schools, and clubs, they are most effective when they present community-wide messages in each setting that are consistent.
12. Should retain core elements of the original research-based intervention when communities adapt programs to match their needs, differing cultural requirements, or community norms.
13. Should be long-term and provide repeated interventions (i.e., booster programs) to reinforce the original prevention goals. It has been shown that gains from middle school prevention programs diminish if there are no follow-up programs in high school.
14. Should include teacher training on effective classroom management practices, such as rewarding appropriate student behavior. These techniques help to enhance academic motivation, achievement, positive behavior, and school bonding in students.
15. Demonstrate the greatest effectiveness when they employ interactive techniques such as parent role-playing and peer discussion groups that allow for active involvement in learning about substance use and/or abuse and reinforcing skills.
16. If research-based, they can be cost-effective. A savings of up to \$10 in substance abuse has been observed for each dollar invested in prevention (NIDA, 2003).

NIDA's principles for prevention are based on longitudinal research studies on the origins of substance use/abuse behaviors as well as the common elements of effective prevention programs. In sum, the principles affirm:

- Prevention programs should reduce or reverse risk factors and enhance protective factors.
- Prevention programs should be tailored to address risks targeted to audience characteristics or to the whole population.
- Prevention programs should be long-term, incorporating repeated interventions such as booster programs to reinforce the original prevention goals (Medina-Mora, 2005).

## Levels of Prevention

The three types of prevention are:

- **Primary** – At this level, at-risk individuals are helped to avoid developing addictive behaviors (NIDA, n.d.) so new cases are prevented (Kane & Ballue, 2013). This is the level where every reasonable effort is made to stop substance abuse/use/misuse from happening in the first place (Duncan & Gold, 1982). Primary care physicians are highly encouraged to reinforce this level of prevention efforts. Youth might be encouraged to seek out and/or

participate in educational and informational opportunities that address the consequences of tobacco and/or substance use. If programs such as Students Taught Awareness and Resistance (STAR) are operating in the young person's school, he or she might be encouraged to participate. These programs teach skills that help young people avoid high-risk activities. School based programs that involve youth supports such as peers, family, and community, tend to raise the level of effectiveness (NIDA, n.d.). Such programs might be referred to as multiple-component programs (Medina-Mora, 2005).

Some experts have recommended using the Problem Oriented Screening Instrument for Teenagers (POSIT) to screen for substance use and development risk factors in youth (NIDA, n.d.). It can be administered to youth 12 to 19 years of age and is available from the National Clearinghouse for Alcohol and Drug Abuse Information (NIDA, n.d.). However, the POSIT is lengthy (i.e., 139 items) and there is no computerized administration or scoring. Reliability estimates are acceptable, though lower for males on two of the subscales (Knight, Goodman, Pulerwitz, & DuRant, 2001). Screening should assist with the identification of risk factors, which falls under primary prevention (Kane & Ballue, 2013).

This type of prevention should be considered for adults who might be entering or involved in risky situations, e.g., the adult is in or planning to enter a close relationship with an individual who abuses alcohol or other substance, as well. It is also imperative that women of childbearing potential are reminded about the extreme risks associated with substance use and/or abuse during pregnancy (NIDA, n.d.).

Because of the potential impact of this level of prevention, it has been said that its priority needs to be raised. The 2013 budget of the Substance Abuse and Mental Health Services Administration (SAMHSA) for treatment was nearly four times the prevention budget, e.g. In dollar amounts, the 2013 SAMHSA treatment budget was \$1,813 million, compared to \$470 million for the prevention budget (Kane & Ballue, 2013). Additionally, this level of prevention would reduce the amount of dollars spent on "preventable law enforcement, health care, crime, and other costs" (NIDA, 2007)

- **Secondary** – This level of prevention involves uncovering potentially harmful substance use before onset of overt problems or symptoms (NIDA, n.d.). Here new cases are identified very early and typically before the affected individual notices that there may be a problem. At this level, the clinician would screen for the disease and help the affected individual seek out appropriate resources (Kane & Ballue, 2013). This level where early treatment occurs (Duncan & Gold, 1982).
- **Tertiary** – Treatment of the medical consequences of substance abuse and facilitation of enrollment into treatment to minimize further disability is the aim of this level of prevention (NIDA, n.d.). Rehabilitation as well as prevention of disability or death is the aim of this level of prevention (Duncan & Gold, 1982).

## Preventive Interventions

These interventions, as described in the 2009 *Preventing Mental, Emotional, and Behavioral Disorders among Young People: Progress and Possibilities*, were classified based on the people they aim to reach. It should be noted that most preventive interventions are aimed at young people because earlier messages do a better job of delaying or preventing the onset of substance use and/or abuse.

**Universal preventive interventions** focus on a population at large (Kane & Ballue, 2013; Medina-Mora, 2005). For example, using direct messaging to women or those who might influence women addressing elimination or reduction of alcohol consumption during pregnancy fits this type of preventive intervention. There are likely many pamphlets, videos, public service announcements (PSAs), pins, and buttons to communicate the message. There may even be classes for children, educating them on the benefits of alcohol avoidance (Clarren & Salmon, 2010). **Selective preventive interventions** are targeted toward specific individuals or groups (Kane & Ballue, 2013). The risk of developing a substance use disorder (SUD) for these targeted individuals or groups is significantly higher than average. These individuals or groups are at imminent or lifetime risk of developing an SUD (Medina-Mora, 2005). Motivational interviewing and brief interventions as incorporated in SBIRT that encourage change in risky substance use patterns are examples of such interventions (Clarren & Salmon, 2010). **Indicated preventive interventions** are aimed at extremely high-risk persons with early signs, symptoms, or biological markers that are precursors but not yet diagnosable (Kane & Ballue, 2013).

### Examples of Universal Prevention:

Community policies that promote access to early childhood education and education for physicians on prescription drug misuse and preventive prescribing practices are examples of universal prevention (CAPT, 2012).

One program that fits universal prevention description is **Guiding Good Choices (GGC)**. Formerly known as Preparing for the Drug-Free Years, the curriculum educates parents on how to strengthen bonding in their families and reduce risk factors. The parents are engaged in five, two-hour sessions that focus on setting clear expectations, monitoring behavior, and maintaining discipline; family involvement and interaction; and other bonding and family management approaches (NIDA, 2003).

### Examples of Selective Prevention:

Providing peer support groups for adults with a history of substance abuse or prevention education for new immigrant families living in poverty with their young children are examples of selective prevention (CAPT, 2012). **Focus on Families (FOF)** is a notable selective program. Designed for parents receiving methadone treatment and their children, the program seeks to reduce parents' use of illegal substances and teaches family management skills to reduce their children's risk for future drug abuse. It has been demonstrated to show early reduction in family-related risk factors with an overall trend toward positive program effects on child outcomes (NIDA, 2003).

### Examples of Indicated Prevention:

Among indicated prevention strategies are screening, consultation, and referral for families of older adults admitted to emergency departments with potential alcohol-related injuries, as well as information and referral for young adults who violate community and/or campus policies on alcohol and drugs (CAPT, 2012).

**Project towards No Drug Abuse (Project TND)** is an indicated prevention intervention. It targets young people of high school age who attend traditional or alternative high schools. This program is designed to prevent the transition from drug use to drug abuse through the consideration of developmental issues faced by older youth (NIDA, 2003).

Additionally there are *tiered* approaches to substance abuse prevention. It is believed that this approach to service delivery provides individuals a better understanding of the linkages between different parts of the system, relative to level of competence/sophistication and need (TADPEMDG, 2010). Many tiered programs incorporated all three levels of intervention. An example is the **Adolescent Transitions Programs (ATP)**. Designed to provide prevention services to students in middle and junior high school and their parents, ATP includes all three levels of prevention. The universal level is directed to parents of all youth in a school and shows up as a *Family Resource Center*. The *Family Check-Up* is the selective intervention that offers both family assessment and professional support. The indicated level yields direct professional help to the family. Some tiered approaches incorporate only two of the three intervention levels (NIDA, 2003).

## **Prevention Strategies Unique to Alcohol.**

The preconception period is the time that child-bearing women should be screened for alcohol use and/or abuse and, if necessary, offered brief interventions and/or referral to treatment to reduce or completely stop alcohol consumption. No evidence-based studies even hint that any amount of alcohol use is safe during pregnancy, so educating and intervening early is critical (Keegan, Parva, Finnegan, Gerson, & Belden, 2010). Social regulations have demonstrated effectiveness as prevention strategies. Especially effective has been measures that limit the availability of alcohol

**Social regulations have demonstrated effectiveness as (alcohol) prevention strategies (Medina-Mora, 2005).**

through establishment of a minimum legal age for consumption, e.g. Regulations on driving and drinking have also shown effectiveness, including institution of sobriety check points and random breath testing. Regulation of promotion, which includes control of content or

advertising bands have some effect if they are monitored and enforced. Persuasion and education through the use of warning labels, e.g., have shown changes in attitudes and knowledge, though the effect on drinking has not been sustained. Integrated approaches appear to be most effective (Medina-Mora, 2005).

## ***Environmental Prevention.***

Many of the prevention approaches aimed at delaying or preventing alcohol use fall under the rubric of environmental prevention. This form of prevention employs policy interventions to create an alcohol environment that supports safe, healthy behavior. Research over several decades demonstrates that these type of policy reforms work. They have been especially successful in reducing problems associated with youth drinking (AlcoholPolicyMD.com, 2005).

The following are examples of environmental prevention approaches:

- Decreasing the number of alcohol outlets in a community.
  - ✓ Reduces the rates of alcohol-related youth violence

- Holding retailers liable for damage inflicted on individuals by underage and/or intoxicated patrons.
  - ✓ Responsible server practices are promoted and alcohol-related crashes are reduced
- Increasing taxes on alcohol and reducing discount drink specials
  - ✓ Reduces hazardous and heavy drinking among high school and college students
- Increasing enforcement of laws prohibiting sales to underage drinkers
  - ✓ Reduces access to alcohol by young people
- Increasing the minimum legal drinking age to 21
  - ✓ Reduces alcohol-related motor vehicle crashes involving young people
- Reducing the amount of youth exposure to alcohol advertising and increasing the number of alcohol counter-ads
  - ✓ Positively impacts beliefs and intentions young people have regarding alcohol use and may affect their decisions about drinking (AlcoholPolicyMD.com, 2005)
- Reduce the number of public settings where drug use is occurring
  - ✓ Directed patrols, proactive arrests, and problem-solving at high-crime “hot spots” have served to reduce crime associated with substance use.
- Reduce the availability of drug paraphernalia in retail alcohol outlets
  - ✓ This effort has shown to be effective in ensuring merchant compliance with existing laws (Sonoma County Department of Health Services, 2007).

Environmental approaches are typically implemented at the local level in response to community pressure and concern for action. These strategies serve to complement rather than replace strategies that target individual behavior (e.g., social norms and other educational programs). Environmental approaches enhance individually based strategies, creating a social climate that reinforces the educational messages (AlcoholPolicyMD.com, 2005).

The community coalitions program is one through which Substance Abuse Prevention Coalitions (SAPCs) have demonstrated their understanding of the Strategic Prevention Framework (SPF) and the capacity to complete a comprehensive community plan that includes: an Assessment of Need; Capacity Assessment; Planning Process; Implementation Plan; and Evaluation Plan as described by the SAMHSA’s SPF process. Environmental strategies incorporate prevention efforts aimed at changing or influencing community conditions, standards, institutions, structures, systems and policies.

## Prevention Resources

### National Substance Abuse Prevention Month.

The month of October was designated through Presidential Proclamation as national Substance Abuse Prevention Month in 2011. This was the first time for such a designation and allowed for a full-month observance of the role that substance abuse prevention plays in promoting healthy and safe communities. This month is a time of tribute to everyone that works to prevent substance abuse in communities. It further is a time for individuals to rededicate themselves to building a safer, drug-free country (ONDCP, n.d.).

### National Prevention Week.

This time is set aside to increase public awareness and action around substance abuse. The goals are: 1) foster collaboration and partnerships with national and federal entities dedicated to behavioral and public health; 2) disseminate and promote quality behavioral health publications and resources; and 3) involve communities in implementing prevention strategies while raising awareness of behavioral health issues (SAMHSA, 2014).

The third week in May has been set aside each year. The timing allows schools to take part in prevention-themed events in advance of the end of the school year, thus giving the opportunity to raise awareness for students across all ages. Youth drug use, especially alcohol, cigarette, and marijuana use, spikes between spring and summer so this week is a pivotal time to provide education to the young people and their families. Communities are asked to get involved in this week. Provide health fairs, block parties, educational assemblies, town hall meetings—the list can go on and on—to help raise awareness about the importance of preventing substance use/abuse (SAMHSA, 2014).

### *"I Choose" Project.*

During National Prevention Week each year, individuals get to “choose” how to be a positive example, make a difference, and inspire other people. *And it's easy to do.* The individual takes a picture of himself/herself holding a sign showing a personal message about why he or she believes substance abuse prevention is important. Then the person should send the photo/message to [NewMedia@samhsa.hhs.gov](mailto:NewMedia@samhsa.hhs.gov). The following information should be included in the message:

- Name
- State
- Zip code
- The "I Choose" message with the individual's photo.
- Optional: Include an organizational name.

When the photo/message is received, SAMHSA will review it for posting to the ["I Choose" photo gallery](#). Make certain that the photo/message does not violate conditions set forth for submission (SAMHSA, 2014).

## **Coalition for Healthy and Safe Campus Communities (CHASCo).**

The Coalition for Healthy and Safe Campus Communities (CHASCo) is a prevention service designed to address the problem of high-risk drinking among college students and young adults in the state. According to the National Institute on Alcohol Abuse and Alcoholism's (NIAAA's) Update on College Drinking report, these students continue to demonstrate disturbing increases in unhealthy and binge drinking driving while intoxicated, and alcohol-related injuries and deaths. The report also highlighted the fact that college students continue to put themselves at risk with their level and frequency of alcohol consumption. Moreover, college students that do not drink are still exposed to negative alcohol-use consequences, including assaults, increased traffic crashes, property damage, and other crimes (TDMHSAS, 2013).

CHASCo's vision is to be recognized nationally as a model for effective statewide coalitions of institutions of higher education that address campus safety and prevention issues. They proactively address these issues by providing high-quality consultation and training, research support, technical assistance, and policy development to member institutions. Further, CHASCo actively seeks partnerships with community and state agencies to assist campuses in having a variety of options in alignment with their alcohol, substance, and violence prevention efforts (CHASCo Web site, n.d.).

Prevention services are provided at various campuses across the state—public as well as private, four-year versus two year, and in each of the three grand regions. Funding is provided through TDMHSAS (TDMHSAS, 2013).

## **National Youth Anti-Drug Media Campaign.**

This campaign was established by Congress in 1998 to prevent and reduce youth drug use. Originally there were two distinct areas of focus: a teen-targeted Above the Influence (ATI) Campaign, and a young adult-targeted Anti-Meth Campaign. The campaign was later redirected and expanded to focus on marijuana use (GAO, 2006). Federal oversight has ceased and the campaign is currently affiliated with the non-profit *Partnership for Drug-Free Kids* (Abovetheinfluence.com, n.d.).

### ***Above the Influence (ATI).***

This brand was created to strengthen the anti-drug beliefs of young people. It was designed to speak to teens, encouraging them to live “above the influence” of substances, including alcohol, and to reject the use of any substance that slows or hinders reach of their life goals. Early reports about the effectiveness of the ATI media campaign were not favorable. Those results indicated that no campaign exposure effects were found on rates of quitting or use for prior users of marijuana (GAO, 2006). Hence, an ATI media campaign re-launch occurred in 2010. This campaign was much broader in scope and incorporated national-level television, Internet advertising, and a strong online presence through an ATI Facebook page, [AboveTheInfluence.com](http://AboveTheInfluence.com), and the [Above the Influence \(ATI\) YouTube channel](#). More than 75 percent of young people said this re-launched message spoke to someone like them, regardless of gender, ethnicity, or race. Results from the re-launch were also more positive. Young people in the new ATI campaign were observed to be less likely to initiate use of marijuana compared to those who had not been exposed to the campaign. Moreover, the young people who viewed the ads were more likely than their peers to say that marijuana

use was not consistent with being independent and autonomous, and that it would interfere with their aspirations and goals (ONDCP, 2012).

The *Anti-Meth Campaign* was developed through comprehensive research and testing with members of the target audience. This campaign continues to be viable through print, TV, radio, and online anti-meth advertising in areas of the country hardest hit by meth. A mobile/texting component provides linkages to local resources. Mobile SMS (or “text”) codes have been added to out-of-home methamphetamine ads. Those viewing the ads can use their mobile phones to send a text message and receive a reply with information and links to local methamphetamine prevention and treatment resources. Research has shown stronger anti-methamphetamine beliefs for adults 18-35 years of age with more ad exposure compared to adults with less exposure (ONDCP, 2011).

All messaging served as vital prevention resources. The Media Campaign used paid advertising to ensure effective media placement of messages and required media outlets to “match” each paid advertisement placement with a donated (or free) placement (ONDCP, 2011).

# Early Intervention

Early intervention is included in the scope of prevention, focusing on persons that have experimented with substances but are not severely dependent. Such individuals can be re-educated through a variety of learning interventions (Medina-Mora, 2005). Thus, early intervention is a strategic activity within the risk-focused prevention framework where individuals at risk are identified, observed, assessed, and referred to intervention and/or treatment, as necessary (Deed, 2007). Early treatment interventions such as mandatory treatment for drivers who continue to drink and drive, for example, have proven effective (Medina-Mora, 2005).

Typically persons who might benefit from early intervention have not yet spun out of control in their substance use. They have likely encountered negative consequences as a result of their involvement with substances, such as dealing with a first-time driving-under-the-influence (DUI) charge or minor possession charge, however. The early intervention is employed in an attempt to reduce the probability of more serious substance use behaviors (SAMHSA/CSAT, 1999).

## Screening, Brief Intervention, and Referral to Treatment (SBIRT)

Screening, Brief Intervention, and Referral to Treatment (SBIRT) is perhaps the most popular buzz word associated with early intervention. It is a public health approach to the delivery of early intervention (and treatment services) for individuals with substance use issues, including those at risk (SAMHSA/SBIRT, 2014).

In the 2001 landmark report, “*Crossing the Quality Chasm: A New Health System for the 21st Century*”, the Institute of Medicine (IOM) specifically cited Screening, Brief Intervention, and Referral to Treatment (SBIRT) as a promising practice (SAMHSA/HRSA/CIHS, 2013). Today SBIRT has

achieved evidence-based status. It is used to identify, reduce, and prevent issues with use, abuse, and dependence on alcohol and illicit drugs. The model promotes community-based screening for risky health behaviors, including substance use. It consists of three major components:

- **Screening** – Assessment of individuals' risky substance use behaviors using standardized screening tools

This component provides a quick and easy way to identify persons who use substances at hazardous or at-risk levels and who many already have a substance use disorder (SUD). The screening tool provides specific information and feedback to the individual about his or her substance use. Typically the process starts with the use of one to three screening questions. If the individual obtains a positive screen of one of the instruments, he or she is then given a longer alcohol or substance use measure that involves the use of a standardized risk assessment tool such as Alcohol Use Disorders Identification Test (AUDIT) or Drug Abuse Screening Test (DAST)-10. The questions and instruments are easily administered and provide self-reported information that can be scored easily (SAMHSA/HRSA/CIHS, 2013). In our state, the Patient Health Questionnaire (PHQ)-4 is also administered to identify any co-occurring anxiety and/or depressive issues (A. McKinney-Jones, personal communication, August 5, 2014).

- **Brief Intervention** – Engagement of individuals that show risky substance use behaviors in brief conversation, providing feedback and advice

The brief intervention is designed to motivate individuals to change their behavior(s) and prevent the progression of substance use. During the intervention, patients are:

- Given information about their substance use based on their risk assessment scores.
- Advised in clear, respectful terms to reduce or abstain from substance use.
- Encouraged to set goals to reduce substance use and to identify specific steps that will help them reach those goals.
- Taught behavior change skills that will decrease substance use and associated negative consequences.
- If necessary, given a referral for further care (SAMHSA/HRSA/CIHS, 2013).

Typically brief interventions are used with individuals reporting less severe alcohol or substance use who are not presently in need of a referral to additional treatment and services. Only minimal training is required to conduct these interventions (SAMHSA/HRSA/CIHS, 2013). Brief interventions involve counseling sessions that last between five and 15 minutes. They are designed to enhance an individual's awareness of his or her alcohol and/or drug use and its consequences, with the intention of motivating the individual to reduce risky drinking or drug-seeking behaviors and getting treatment (APHA, 2008). In the case of individuals with addictions, more intensive interventions may be needed. Conversations around intensive intervention are similar to that of the brief interventions but the sessions tend to be longer (20-30 minutes). It is possible that multiple sessions, referral to an addiction treatment program, and/or the provision of pharmacological therapy may be necessary (SAMHSA/HRSA/CIHS, 2013).

- **Referral to Treatment** – Provision of a referral to therapy or other treatments to individuals whose screening results suggest the need of additional services (CMS, 2013).

This component includes a more advanced treatment option so the individual is referred to a higher level of care. Often this care is provided at addiction treatment centers. The referral to treatment process consists of helping individuals to access treatment, selecting treatment facilities, and facilitating the navigation of any barriers such as cost of treatment or lack of transportation or child care that would hinder them from receiving treatment in this type of treatment setting. In order for this process to occur smoothly, the referring agent must initially establish and cultivate relationships with specialty providers, and then share pertinent patient information with the referral provider. Handling the referral process properly and ensuring that the individual receives the necessary care coordination and follow-up support services are critical to the treatment process and to facilitating and assisting in maintenance of recovery (SAMHSA/HRSA/CIHS, 2013).

As an early intervention, SBIRT targets individuals with moderate to high risk of substance use, providing effective strategies for intervention before there is a need for more extensive or specialized treatment. The approach is not designed for individuals with more severe substance use or those who meet the criteria for a diagnosis of Substance Use Disorder (SUD) (CMS, 2013).

The goal of SBIRT is to prevent the unhealthy consequences of alcohol and substance use for persons whose use may not have reached the diagnostic level of SUD and to assist those with the disease of addiction enter and stay with treatment. SBIRT can be used easily in a variety of settings, including primary care settings, to systematically screen and deliver services to persons who may not be seeking help for a substance use problem, but whose alcohol consumption or substance use may cause or complicate their ability to successfully handle family, work, or health issues (CMS, 2013). Since its inception in 2003, 19 percent of screened individuals have required brief intervention, brief treatment, or referral to specialty treatment services (SAMHSA/SBIRT, 2014).

Despite its promise especially in reaching pregnant women who otherwise may go unidentified, the literature has noted that implementation of the brief intervention component of SBIRT in real-world settings is very slow. Some studies have suggested that doing all recommended screening and prevention SBIRT tasks would take a primary care provider more than four hours per working day, time not in the schedule of primary care physicians. As a result, few physicians, including obstetricians, actually fully implement the recommended brief intervention strategies. To counteract these problems, a computer-delivered intervention has been proposed. Brief education that emphasizes current information regarding negative outcomes of both mother and newborn is presented as part of the intervention. Pilot outcomes were promising, showing reports of reduced substance use for the mothers and higher birth weights for the newborns. Further research is still warranted for computer-based delivery of brief interventions (Tzilos, Sokol, & Ondersma, 2011).

There are manifold resources to educate prospective providers about SBIRT as well as assist them in implementing the intervention (SAMHSA/HRSA/CIHS, 2013). A few of them are listed below.

- **SBIRT App.** This tool was developed at Baylor College of Medicine to support the use of SBIRT by physicians, other healthcare workers, and mental health professionals. Free to download, it provides evidence-based questions to screen for use of alcohol and other substances including tobacco. The app includes a screening tool to further evaluate specific

substance use, if warranted. Also included are steps to complete a brief intervention and/or referral to treatment for the client based on motivational interviewing.

- **TAP 33: Systems-Level Implementation of Screening, Brief Intervention, and Referral to Treatment (SBIRT).** This TAP provides a description of core elements of screening, brief intervention, and referral to treatment (SBIRT) programs for individuals with or at risk for substance use disorders. The TAP further includes general administrative and managerial information relevant to implementing SBIRT services. Among the covered information are implementation models, challenges and barriers to implementation, and issues around cost and sustainability.
- **Alcohol Screening and Brief Intervention for Youth: A Practitioner's Guide.** Developed by NIAAA, this guide introduces a quick, simple, empirically derived tool for identifying young people at risk of alcohol-related problems. Designed for clinicians who work with youth between the ages of nine and 18, the guide can help detect risk early using the first tool to include a “friends” drinking question. Research has identified friends as an important risk factor in drinking behaviors of youth. The guide was produced in collaboration with the American Academy of Pediatrics (AAP), clinical researchers, and health practitioners.

# Evidence-Based Treatments

Despite the call for evidence-based treatment (EBP) practices in substance use (SU) treatments, only a fraction are validated by the most rigorous evidence in the current scientific literature.

Nonetheless, the National Quality Forum (NQF) identified seven core practices for SU treatment that are supported by scientific evidence and merit widespread implementation.

**Practice 1. Screening.** All patients/clients in general and behavioral healthcare settings (including primary care, urgent care, and emergency care) should be screened for alcohol and other drug use/misuse whenever a care encounter provides the opportunity. A selection of EB screening and assessment tools and links are found in this tool guide.

**Practice 2. Initial Brief Intervention.** All patients/clients with a positive screen should receive a brief intervention by a healthcare practitioner trained in this technique. Brief intervention should include assessment and follow-up care, including referral to specialty services and systematic monitoring as needed. Tips on brief intervention can be found in the section on Early Intervention in the *Prevention/Early Intervention* module of this guide.

**Practice 3. Prescription for Services.** Each patient/client assessed and diagnosed with SUDs should receive and sign a written “dosing recommendation” that clarifies the treatment plan, i.e., explicitly prescribes the specific services, initial duration, and quantity of each service. Reassessments should be conducted as necessary and services should match patient needs.

**Practice 4. Psychosocial Intervention.** Evidence-based psychosocial treatment interventions should be initiated for all patients referred to specialty care treatment of SUDs. Examples of EB psychosocial treatments are included in this module, among others.

**Practice 5. Pharmacotherapy.** Pharmacotherapy should be considered for all patients diagnosed with alcohol and/or opioid dependence. EB pharmacological treatments are available for those substance use disorders (SUDs). Such patients/clients should be assessed and, if appropriate and consented to, pharmacotherapy should be initiated.

**Practice 6. Patient Engagement and Retention.** Specialty providers should systematically promote patient/client engagement and improve retention in SUD treatment. EB strategies are included in this tool guide to assist in facilitation of engagement and retention.

**Practice 7. Recovery/Chronic Care Management.** Efforts should be undertaken to engage patients/clients long-term in the management of their care. EB strategies are available in this tool guide that can assist with those efforts.

All treatments included in this module meet the required research rigor and are indeed evidence-based (EB).

# Medication-Assisted Treatments (MATs)

Drug addiction is challenging. Moreover, most substance users have every intention of discontinuing their misuse and/or abuse. In a large number of cases, however, individuals are not able to stop using substances on their own. They need help. Sometimes an individual is able to be successful for a short time, but then he or she will fall back into those old patterns of using. Relapse can occur even if the individual has a strong support system. The reality is that overcoming drug addiction is not an easy feat. It typically takes time to recover. *Further, recovery is a PROCESS, not something that happens in the first decision to be abstinent.* Hence, individuals that truly want to take control of their addiction may need to strongly consider medication-assisted treatment (MAT) AS PART OF THEIR ADDICTION TREATMENT (Chalk & Williams, 2012). **Medication-assisted treatment** (MAT) is a term used to describe the use of pharmacological treatments in individuals with substance use disorders (Chalk & Williams, 2012; CMCS, 2014). It is a direct, individualized service for persons with a substance use disorder (SUD) (Fullerton et al., 2014). In addition to providing pharmacological help, MAT integrates counseling and other supports, especially friends and family, thereby incorporating a whole-person approach to the treatment of substance use disorders (SUDs) (SAMHSA/CSAT, 2011; SAMHSA, 2012b). MAT plus therapy can contribute to lowering an individual's risk of contracting hepatitis C or HIV because the potential for relapse is reduced (CMCS, 2014). Research has shown that these combinations are most effective in the treatment of individuals with SUDs (SAMHSA/CSAT/DPT, n.d.).

Medications can provide several important functions as part of the treatment process. They can help with:

- ✓ **Comforting the individual.** Medications can help make withdrawal symptoms and signs less severe as well as assist the person in being more comfortable during the early days and weeks following quitting substance use. Lessening withdrawal can, in turn, assist in the creation of a context for the person to remain abstinent and continue in treatment rather than return to substance use as a way to relieve withdrawal symptoms.
- ✓ **Reducing cravings.** Appropriate medications serve to alleviate the intrusive thoughts and urges around substance use that may lead the individual with SUDs to return to substances.
- ✓ **Altering effects of the substance(s).** For some of these medications and in certain individuals, these medications eliminate or lessen the effects of substances being used/misused through their own actions in the brain. This action takes away the individual's reason to use the substance of use/misuse in the first place, thereby preventing further relapse.
- ✓ **Retaining the individual in treatment.** Many of the medications have mild but desirable effects sought by individuals with SUD, hence reducing treatment drop out which would interfere with successful recovery (CPDD, n.d.).

At this writing, a variety of medications have been approved by the U.S. Food and Drug Administration (FDA) in the treatment of SUDs: 1) bupropion, nicotine replacement therapy (gum, lozenges, nasal spray, patch, and inhaler), and varenicline for tobacco use disorders (CPDD, n.d.); 2)

acamprosate, disulfiram, and naltrexone (oral and injectable) for alcohol use disorders; and 3) buprenorphine, methadone, and naltrexone (oral and injectable) for opioid use disorders (Chalk & Williams, 2012; CPDD, n.d.; SAMHSA-HRSA/CIHS, 2014). In all cases, the decision as to which medication is prescribed should be based on an understanding of the known pharmacology of the drugs, individual preferences and characteristics of the substance user, and ultimately on the clinician's judgment (Chalk et al., & McLellan, 2013). MATs expand the range of treatment options for persons with addiction to substances, yet national reports continue to show extremely low usage rates in community treatment settings (Chalk & Williams, 2012, e.g.).

MAT continues to be substantially underutilized despite findings of cost effectiveness, clinical effectiveness, and significant reductions in use of detoxification and inpatient services. A study conducted by Roman, Abraham, & Knudsen in 2011 found that less than 30 percent of contemporary substance use treatment programs offered MAT and, of those "offering" programs, less than half of eligible patients actually received medications. It seems that several factors contribute to the low uptake of the evidence-based MAT option, including:

- Agency regulatory policy that forbids or restricts MAT use
  - Criteria that other therapies be tried first or the "Fail first" policy
  - Initial authorization and reauthorization requirements
  - Lack of available prescribers
  - Lack of support for existing prescribers
  - Limits on dosages that can be prescribed (i.e., lifetime or annual medication limits for MAT)
  - Minimal coverage for counseling
  - Workforce misunderstandings and attitudes about the nature and use of medications
- (Roman et al., 2011).

MATs have been recognized for their substantial cost savings. For example, individuals with untreated alcohol use disorders (AUDs) use two times as much health care and cost twice as much as persons who received treatment for their AUD. Research also shows that pregnant women who use/misuse substances and receive MAT demonstrate significantly shorter stays in the hospital compared to those who did not receive MAT. Over a three-year time span, medical costs for Medicaid clients engaged in treatment decreased by 33 percent (CMCS, 2014).

## **Tobacco and MAT**

Nicotine is metabolized and eliminated from the body very quickly so the physical part of nicotine addiction can be broken after seven days of abstinence. The part that takes much longer to overcome is the psychological addiction (Densky, 2012). Its use in the form of cigarettes has shown a marked increase, especially among the youngest (less than 20 years of age) and oldest (over 35 years of age) pregnant mothers (Keegan, Parva, Finnegan, Gerson, & Belden, 2010).

Pharmacological treatments are considered a mainstay for smoking cessation. First-line therapies, as recommended by the FDA because of their evidence of effectiveness consist of nicotine replacement therapies (NRT), bupropion, and varenicline (Douaihy, Kelly, & Sullivan, 2013).

- ✓ **Nicotine replacement therapies** (NRTs). Approved formulations of NRTs include nicotine gum, nicotine lozenge, nicotine vapor inhaler, nicotine nasal spray, and the transdermal nicotine patch. NRTs replace the nicotine obtained from smoking to enhance smoking cessation outcomes and prevent withdrawal symptoms. Started on the quit date, success in quitting on the quit date is highly predictive of end-of-treatment success. Use of NRTs is typically short term, but longer term treatment can produce additional benefits for smokers who are severely addicted. They have been shown to be effective on measures of abstinence (i.e., not even a puff) at the end of clinical trials, as well as at later time points, e.g., six and 12 months, compared to placebo. Combination NRTs have been demonstrated to further improve efficacy, for example combining one medication that allows for passive nicotine delivery such as the transdermal patch with another medication that permits ad libitum nicotine delivery such as inhalers, nasal sprays, or gum. The combination method allows smokers that need slow delivery to achieve a constant concentration of nicotine to relieve withdrawal symptoms and cravings, along with a faster-acting preparation that can be administered as needed for immediate relief of breakthrough withdrawal symptoms and cravings. Labels of these products continue to warn individuals about combining them despite evidence of combination effectiveness (Douaihy et al., 2013). It should also be noted that meta-analyses of these products have indicated them to be effective interventions in achieving sustained abstinence from smoking (The Addiction Recovery Guide, 2014).
- ✓ **Bupropion Sustained-Release** (SR). This medication, marketed as Zyban for smokers, has been effective in helping some people stop smoking (Monson, 2013; The Addiction Recovery Guide, 2014). An atypical antidepressant, the medication has been shown to be effective in enhancing quit rates compared to placebo in both short- and long-term follow-up. Some studies have demonstrated outcomes similar to NRT, but unlike NRT, bupropion is taken one to two weeks before the quit date and then continued post-quit date (Douaihy et al., 2013). Treatment has been associated with reductions in cue-induced activation of the prefrontal and limbic brain regions as well improved ability to resist cue-induced cravings. A six-month follow-up is also recommended for smoking cessation maintenance (The Addiction Recovery Guide, 2014).
- ✓ **Varenicline** (Chantix). This partial nicotine agonist is used for a one to two week period while continuing smoking before actual smoking cessation (Douaihy et al., 2013). It became an FDA- approved treatment to help cigarette smokers stop smoking in 2006 (FDA, 2006). The approved course of treatment is 12 weeks, with successful quitters able to continue 12 more weeks to enhance the likelihood of long-term smoking cessation (The Addiction Recovery Guide, 2014). Unlike nicotine that has a short duration of action, varenicline has a relatively long period of action, requiring only twice daily use. The partial stimulation of varenicline reduces cravings and has been demonstrated to enhance chances of successful

quit attempt, compared to attempts involving unassisted smoking cessation (Douaihy et al., 2013). Its effectiveness was demonstrated in six clinical trials, five of which were randomized controlled. Varenicline was shown to be superior to a placebo in helping people quit smoking. Further, it was shown that persons treated with varenicline were more successful giving up smoking than clients treated with bupropion (FDA, 2006).

*In 2012, the FDA issued a warning regarding serious side effects associated with use of varenicline.* Compared to a placebo group, the group treated with varenicline (Chantix) experienced higher occurrences of major adverse cardiovascular events. Persons being treated with varenicline for smoking cessation are encouraged to contact their health care professional if they experience new or worsening symptoms of cardiovascular disease (The Addiction Recovery Guide, 2014). The medication also has a black box warning due to associations to suicidal behaviors (Ericson, 2014).

### ***Treatment Summary.***

Research studies are continually underway to investigate the benefits of other medications in the treatment of smoking cessation. Anti-smoking vaccines that are given as a series of shots are also still being tested. Results from many of the studies have been promising and safety has been maintained. However, larger studies are needed to demonstrate the efficacy of these treatments before the FDA will approve them for use (ACS, 2014). Stay tuned.

### **Smokeless Tobacco.**

Smokeless tobacco can be defined as tobacco that is not burned. The nicotine in the tobacco, which is addictive, is absorbed through the lining of the mouth. Research has shown that nicotine stays in the blood longer for users of smokeless tobacco than for cigarette smokers (National Cancer Institute, n.d.).

The two main types of smokeless tobacco are chewing tobacco and snuff. Chewing tobacco is typically placed between the cheek and lower lip toward the back of the mouth and can be chewed or held in place. The saliva is either swallowed or spit. Snuff can be packaged dry or moist and may be sold in a variety of different flavors and scents. A pinch or pouch of the moist form is typically placed between the cheek and gums or behind the upper or lower lip. The dry form is sometimes inhaled into the nose (National Cancer Institute, n.d.).

Addiction to smokeless tobacco is as deadly as addiction to cigarette smoking. In fact, many experts will say it is even more dangerous (Densky, 2012; National Cancer Institute, n.d.). As many as 28 chemicals in smokeless tobacco have been found to cause cancer. Moreover the advisory committee to the Surgeon General concluded way back in 1986 that using smokeless tobacco was not a safe substitute for smoking cigarettes. A 2006 panel of experts convened by the National Institutes of Health (NIH) even acknowledged that the range of risks associated with smokeless tobacco products probably varies extensively due to the differing levels of carcinogens, nicotine, and other toxins in the various products (National Cancer Institute, n.d.).

As with cigarette products, smokeless tobacco products must carry warning labels. Further, radio and television advertising is banned. There are new warning labels for these products, which are to be rotated quarterly, that read:

- **WARNING: THIS PRODUCT MAY CAUSE MOUTH CANCER.**
- **WARNING: THIS PRODUCT MAY CAUSE GUM DISEASE AND TOOTH LOSS.**
- **WARNING: THIS PRODUCT IS NOT A SAFE ALTERNATIVE TO CIGARETTES (Akoury, 2014).**

Smokeless tobacco has been directly linked to laryngeal, oral, and pharyngeal cancer, as well as esophageal cancer, tooth loss, and gum disease. The use of these products has been on the increase, especially among America's young people (Akoury, 2014; National Cancer Institute, n.d.).

As a preventive measure, the National Spit Tobacco Education Program (NSTEP) provides education on smokeless tobacco use. The organization targets the general public but specifically is aimed at baseball players and their families, groups for whom the use of smokeless tobacco is extremely high. NSTEP is endorsed and supported by both Major League and Little League Baseball (Cheng et al., 2014).

### **Pharmacological Treatments: Smokeless Tobacco.**

Meta-analytic studies have been a primary source of research on the effectiveness of pharmacological treatments for users of smokeless tobacco. However, nicotine replacement therapy (NRT) has been shown to enhance short-term tobacco abstinence rates, as well as to alleviate craving and withdrawal symptoms for users trying to quit using smokeless tobacco. Bupropion sustained release has demonstrated decreases in craving and weakened post-cessation weight gain among users of smokeless tobacco trying to quit. Long-term abstinence rates (i.e., at least six months) have only been demonstrated with the use of varenicline (Chantix) (Ebbert & Fagerstrom, 2012).

On the whole, findings from studies investigating pharmacological treatments for users of smokeless tobacco have not been as promising as desired. They may hold some promise for increasing abstinence rates for users not interested in quitting. Additional investigations of higher dose NRT and combination pharmacological therapies have been recommended to advance the treatment of users of smokeless tobacco (Ebbert & Fagerstrom, 2012).

## **Alcohol and MAT**

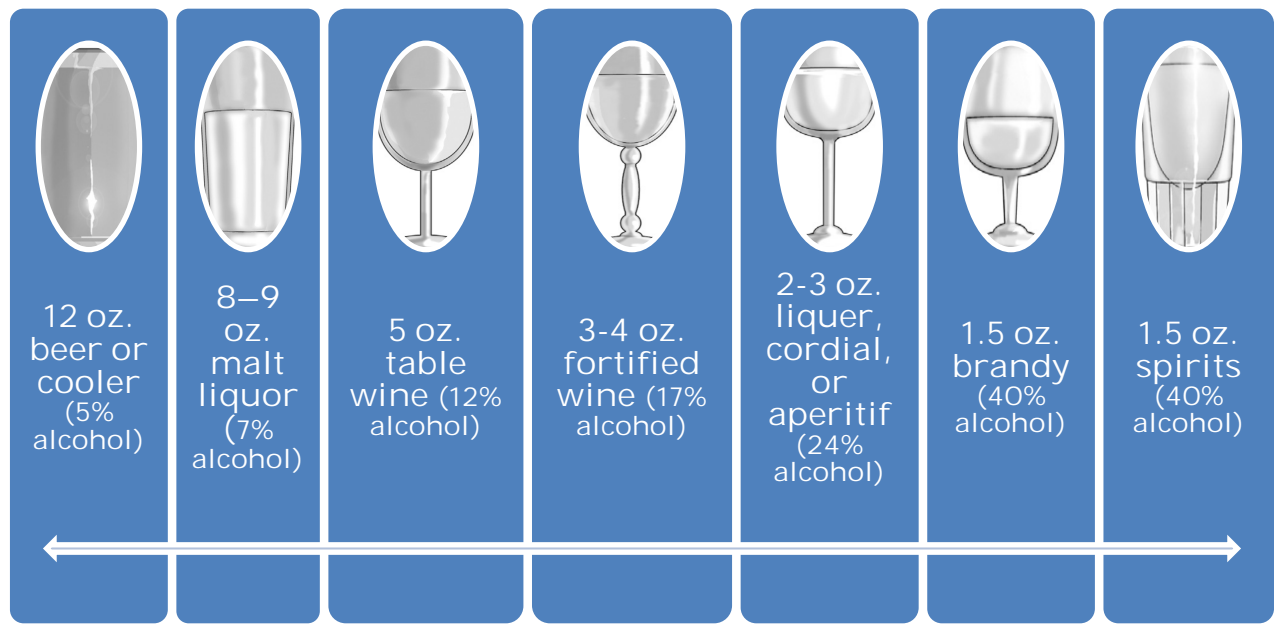
Consumption of alcohol is pervasive in the United States (Pearson, Dube, Nelson, & Caetano, 2009). In excess of 90 percent of adult Americans have consumed alcohol at some point in their lives and nearly 70 percent continue to consume it during adulthood. The majority of adults can drink moderate amounts of alcohol—one drink daily for women and up to two drinks per day for men—and avoid problems related to alcohol consumption. However, 10 to 15 percent of individuals exposed to alcohol come to use/misuse it or become dependent upon it, making alcohol use disorder (AUD) very common (O'Brien, 2012). Recent estimates show as many as 20 percent of patients seen in hospital or primary care setting has a diagnosable AUD (SAMHSA & NIAAA, 2015).

### **What Is “Too Much” Alcohol?**

When drinking causes or elevates the risk of alcohol-related problems or complicates the management of other health problems, drinking has become a problem. Epidemiologic research has shown that women who consume more than three standard drinks in a day (or more than seven per week) and men who consume more than four standard drinks in a day (or more than 14 per week) are at increased risk for alcohol-related problems. Of course, individuals vary in the way they respond to alcohol which means that drinking even at lower levels can be problematic depending on other factors such as coexisting conditions, use of medication, and age. Further, the Surgeon General has urged abstinence for women who are or may become pregnant since 2005 because there is no data on the amount of alcohol that would be safe during pregnancy (NIH/NIAAA, 2007).

### **What Is a Standard Drink?**

In the United States, a standard drink refers to any drink that contains about 14 grams of pure alcohol (1.2 tablespoons or 0.6 fluid ounces). However, many individuals do not know what constitutes a standard drink and thus do not realize how many standard drinks are in the containers in which the drinks are often sold or distributed when purchased. The chart below shows typical standard drink equivalents (NIH/NIAAA, 2007).



Additional examples of standard drinks are provided below. The approximate number of standard drinks in:

✓ **Beer**

- 12 oz. = 1
- 22 oz. = 2

- 16 oz. = 1.3
- 40 oz. = 3.3

✓ **Malt Liquor**

- 12 oz. = 1.5
- 22 oz. = 2.5

- 16 oz. = 2
- 40 oz. = 4.5

✓ **Table Wine**

For **table wine**, the approximate number of standard drinks in

- a standard 750-mL (25-oz.) bottle = 5

✓ **80 Proof Spirits** (hard liquor)

- a mixed drink = 1 or more\*
- a fifth (25 oz.) = 17
- a pint (16 oz.) = 11
- 1.75 L (59 oz.) = 39

\*It should be noted that estimates of the number of standard drinks in mixed drinks made with hard liquor are difficult and a function of the type of spirits as well as the recipe. A mixed drink, hence, can contain from one to three or more standard drinks (NIH/NIAAA, 2007).

## Binge Drinking.

**Binge drinking** constitutes four or more drinks in a single bout for women and five or more for men (Carroll, 2014; SAMHSAS/CBHSQ, 2014a). Moreover, one in every six adults engages in binge drinking, and that plays a substantial role in most alcohol-related deaths (Shute, 2014).

However, alcohol deaths are very preventable, ranking fourth behind smoking, poor nutrition and lack of activity (Shute, 2014). For the combined period of 2010 to 2012, Southern states reported

the lowest rates of underage binge alcohol use (SAMHSA/CBHSQ, 2014a).

One in six adults engages in binge drinking, and that plays a substantial role in most alcohol-related deaths (Shute, 2014).

Contrary to popular belief, alcoholics or persons addicted to alcohol, are not the big problem.

Ten percent of all deaths have been

linked to excessive drinking. In fact, it is reported that binge drinking, along with heavy regular drinking, shortened the lives of those who died by 30 years (Carroll, 2014; Shute, 2014).

## Other Drinking.

Drinking at least five drinks on the same occasion on five or more days in the past 30 days is the definition for **heavy alcohol use** (APHA, 2008; SAMHSA/CBHSQ, 2014c). Data from the 2013 National Survey on Drug Use and Health (NSDUH) showed 1.2 percent of adolescents age 12 to 17 as heavy drinkers, based on their alcohol use in the past month. Adults 18 years of age and older represented 6.8 percent of the heavy alcohol users (SAMHSA/CBHSQ, 2014c).

Combined data from the 2011 and 2012 National Survey on Drug Use and Health (NSDUH) showed that of young adults 18 to 25 years of age who used alcohol in the past month, older ages drink alcohol more days than younger ages. The 21-25 year of age group drank 7.5 days per month compared to 5.7 days per month for 18 to 20 year olds. **However**, younger ages drank more drinks per day on they days they drank, with young adults ages 18 to 20 drinking 4.8 drinks and those ages 21 to 25 drinking 3.9 drinks per day (SAMHSA/CBHSQ, 2014b).

Physicians in one study defined **light drinking** as 1.2 drinks per day on average, an amount exceeding guidelines established by the National Institute on Alcohol Abuse and Alcoholism (NIAAA) for at-risk drinking for women (ACOG, 2008).

According to the American Public Health Association (2008), **moderate drinking** can be defined as:

- Up to two drinks per day – Men
- Up to one drink per day- Women or individuals 65 years and older

**Excessive alcohol use** leads to a poorer quality of life, hampered productivity in the workplace, decreased academic performance, and other negative consequences and outcomes. Defined, excessive alcohol use includes alcohol impaired driving, drinking while pregnant, underage drinking, and binge drinking (National Prevention Strategy, 2014). The Centers for Disease Control and

Prevention (n.d.) defined excessive alcohol use as follows: alcohol use by pregnant women, alcohol use by underage individuals, heavy drinkers, and binge drinkers.

## **Medication/Alcohol Interactions.**

Alcohol can interact negatively with medications either by enhancing the effects of the medication (particularly in the central nervous system) or by interfering with the metabolism of the medication (generally in the liver). Many classes of prescription medications can interact with alcohol, including antihistamines, antidepressants, antibiotics, benzodiazepines, barbiturates, muscle relaxants, histamine H2 receptor agonists, anti-inflammatory agents, opioids, nonopioid pain medications, and warfarin. Negative side effects are likely when herbal preparations and many over-the-counter medications are taken with alcohol (NIH/NIAAA, 2007).

## **Pharmacological Treatments.**

Treatment involving medications or medication-assisted treatments (MATs) for alcohol dependence should be used adjunctively to psychosocial treatments rather than as replacement. This combination has shown to be more effective than either medication or nondrug therapy alone. To the extent that pharmacological therapy reduces craving and helps maintain abstinence, it likely makes individuals with AUD more agreeable to psychosocial interventions (SAMHSA/CSAT, 2009).

A medical management (MM) strategy has been designed specifically to accompany pharmacological therapy for alcohol use disorders (AUDs). MM not only gives structure, but supplies materials to help clinicians offer their clients strategies for taking medications and staying in treatment; support their clients' efforts in changing their drinking habits; provide recommendations to their clients for changing drinking habits; and stay informed about alcohol dependence and pharmacological therapy research and recommendations (SAMHSA/CSAT, 2009).

Three medications have been approved by the United States Food and Drug Administration (FDA) in the treatment of alcohol use disorders (AUDs). These medicines consist of disulfiram, acamprosate, and naltrexone (oral and extended-release injectable). Counseling and other supports should be part of the MAT package (CPDD, 2013; Douaihy et al., 2013; SAMHSA/CSAT, 2009).

### ***Disulfiram.***

Disulfiram, also known as Antabuse®, was the first FDA-approved pharmacological treatment for AUDs. Approval was obtained in 1951. An alcohol-sensitizing or alcohol-aversive agent that initiates an acutely toxic physical reaction when mixed with alcohol, disulfiram causes extremely uncomfortable symptoms such as vomiting, headache, and severe nausea. Research continues to support its establishment as an effective and safe treatment of AUDs in particular client groups (SAMHSA/CSAT, 2009). Individuals having the following profiles are considered good candidates for disulfiram as a pharmacological treatment for AUD:

- Medically appropriate.

- Maintain abstinence from alcohol during treatment.
- Have the capacity to fully understand the consequences associated with alcohol use while taking this medication.
- Can receive supervised dosing.
- Are abstinent from alcohol use (i.e., clients must have abstained from alcohol use at minimum 12 hours and/or breath or blood alcohol levels are zero).
- Treatment motivated and committed to total abstinence.
- Have codependence on or current use/misuse of cocaine (SAMHSA/CSAT, 2009).

Under no circumstances should disulfiram be administered to a client that is in a state of alcohol intoxication or without the client's full knowledge and consent. Neither should disulfiram be used by pregnant women. Not enough is known about the potential risk to the fetus. Clinicians should advise family members and/or other supports about these and other contraindications. The Antabuse® package insert includes a **black box warning** (SAMHSA/CSAT, 2009).

**Trade name:** Antabuse®.

**How taken:** Tablet by mouth once daily (May be crushed and mixed with water, milk, tea, coffee, soft drink, or fruit juice).

**How supplied:** 250 or 500 milligram (mg) tablets.

Source: SAMHSA/CSAT, 2009 (TIP 49)

### ***Contraindications***

<i>Condition or Circumstance</i>	<i>Treatment Recommendation</i>
Clients with histories of cardiac disease, diabetes mellitus, hypothyroidism, epilepsy, cerebral damage, chronic or acute nephritis, hepatic cirrhosis, or hepatic insufficiency	Use with caution. No evidence exists that clients with preexisting liver disease are more likely to suffer severe liver toxicity from disulfiram.
Clients with hepatitis C	If baseline transaminase levels are normal or only moderately elevated (< 5 times the upper limit of normal), carefully monitor liver function.

<i>Condition or Circumstance</i> (continued)	<i>Treatment Recommendation</i> (continued)
Clients receiving or who have recently received metronidazole, paraldehyde, alcohol, or alcohol-containing preparations (e.g., cough syrups, tonics). Clients exposed to ethylene dibromide or its vapors (e.g., in paint, paint thinner, varnish, shellac).	Do not use until substances are out of client's system.
Adults ages 61 and older	May need to decrease dosage
Children and adolescents	Prescribe with caution. Medication has not been evaluated for safety or efficacy in these populations.

Source: SAMHSA/CSAT, 2009 (TIP 49)

Taking the medication each day communicates to the individual that he or she will have this unpleasant, uncomfortable reaction if alcohol or alcohol-based products are consumed. Armed with this knowledge, the person can work to refrain from drinking. However, people realize they can avoid the reaction they do not want simply by stopping the medication. Thus, high levels of motivation to abstain are necessary for disulfiram to be effective. In general, older men with worse drinking histories but more socially stable and participating in Alcoholics Anonymous (AA) are more likely to adhere to the regimens of the medication and achieve enhanced outcomes ((Douaihy et al., 2013).

### ***Acamprosate.***

Approved in 2004 by the FDA for AUDs, acamprosate (Brand name = Campral®) is a relapse-prevention medication that affects various neurotransmitters, structurally resembles GABA and glutamate (Douaihy et al., 2013), and has a good safety profile (Acamprosate, 2012). Usually initiated after individuals stop drinking, it can be safely used with alcohol or with benzodiazepines. It can also be started during medically supervised withdrawal. It reaches full effectiveness in five to eight days and should be maintained if a client relapses to alcohol use. In general, there is no specific client profile that must be considered if planning to use acamprosate in the treatment of AUDs. Not surprising though, it is most effective for clients that are motivated toward complete abstinence rather than decreased drinking when treatment begins. Acamprosate may also be utilized concurrently by clients undergoing opioid maintenance therapy. The fact that there are no known clinically significant drug interactions associated with acamprosate appears to give it a safety valve for clients that are trying to deal with multiple medical issues and are currently taking many other medications (SAMHSA/CSAT, 2009).

Efficacy for acamprosate has been mixed. In the COMBINE Trial, the largest multisite study of treatment for alcohol dependence to date in this country, the medication showed no greater benefit than placebo for clients dependent on alcohol. It should be noted that the U.S. trials contained limited numbers of individuals and they should have undergone detoxification prior to treatment. Acamprosate has been studied much more extensively in Europe where results have been positive. European studies demonstrated acamprosate's effectiveness over placebo in significantly increasing the proportion of clients who were already abstinent to remain continuously abstinent (Douaihy et al., 2013).

**Trade name:** Campral®.

**How taken:** Two tablets by mouth three times daily, with or without food (With some clients, a lower dose may be effective. This lower dose *must* be used with those that have impaired renal function.)

**How supplied:** 333 mg delayed-release, enteric-coated tablets.

Source: SAMHSA/CSAT, 2009 (TIP 49)

### ***Contraindications***

<i>Condition or Circumstance</i>	<i>Treatment Recommendation</i>
Clients who are hypersensitive to acamprosate or its components	Do not prescribe acamprosate.
Clients with severe renal impairment (creatinine clearance $\leq 30$ mL/min)	Do not prescribe acamprosate.

Source: SAMHSA/CSAT, 2009 (TIP 49)

Benefits associated with treatment of alcohol dependence with acamprosate include limited side effects, no negative liver effects, and no drug interaction profiles. Yet dosing three times a day may negatively impact client adherence. Clinicians might help their clients improve adherence by assisting them in identifying reminders that will work for them, e.g., having them wear “reminder” bracelets, setting alarms on watches/clocks/cell phones, or purchasing three-a-day pill containers (SAMHSA/CSAT, 2009).

## ***Naltrexone.***

Naltrexone is an opioid antagonist that was first developed as treatment for opioid addiction. It was not until the mid-1990’s that the FDA approved the drug for treatment of AUDs. Naltrexone oral might be referenced as Revia® or Depade® (SAMHSA/CSAT, 2009). Oral naltrexone has demonstrated reductions in intensity and frequency of drinking, reductions in risk of relapse to heavy drinking, and increases in the percentage of days that individuals remain abstinent. Most published controlled studies compared the medication to placebo (Douaihy et al., 2013).

### ***Oral Naltrexone.***

Oral naltrexone is an antagonist that blocks the effect of other narcotics and alcohol. First developed in the treatment of opioid addiction, naltrexone was FDA approved for treatment of AUDs in the mid-1990’s (SAMHSA/CSAT, 2009). It works to help reduce alcohol cravings and to lessen alcohol’s positive effects. Naltrexone showed effectiveness when used in conjunction with other treatments such as counseling, group therapy, Alcoholics Anonymous (AA) meetings, family therapy, and residential or hospital treatment. However, adherence to daily doses is problematic (The Addiction Recovery Guide, 2014).

Oral naltrexone's FDA approval includes a black-box warning for hepatotoxicity, especially when given in excessive doses. It is contraindicated in liver failure or acute hepatitis and use in clients that have active liver disease must be carefully considered. The effects are reversible and have shown to be primarily associated with much higher doses than typically used in routine clinical practice (e.g., at least 300 mg/day). Research further suggests that the negative effects tend to show up only after clients have been on these higher doses for extended periods of time (SAMHSA/CSAT, 2009).

As with other medications used to assist in substance use treatment, it is recommended that signs and symptoms of acute alcohol withdrawal have subsided in advance of treatment initiation. At least three days of abstinence are typically recommended, with seven days preferred. However, it is safe to initiate treatment involving oral naltrexone during medically supervised withdrawal or if the individual is actively drinking. Abstinence lessens withdrawal side effects (SAMHSA/CSAT, 2009).

Clients who are motivated to participate in treatment or those who will allow medication monitoring have been deemed as good candidates for oral naltrexone. It has further been shown that persons with intense alcohol cravings make good candidates for oral naltrexone treatment. Persons being considered for treatment of AUDs with oral naltrexone should be educated about the effects of using opioids and/or other drugs while taking the prescribed medication (SAMHSA, 2015).

The pill form is typically prescribed as a single daily dose. In general, prescriptions run for 12 weeks when individuals who are abstinent to reduce the craving for alcohol early on during treatment, when the risk of relapse is greatest (about.com, 2014). In fact, the label says that oral naltrexone should be taken for a period up to three months for the treatment of AUDs. However, it is recommended that treatment involving oral naltrexone be individualized. Thus, some individuals may be treated for three months while other persons might be treated for as long as 12 months (SAMHSA/CSAT, 2009).

**Trade name:** ReVia®; Depade®

**How taken:** Tablet by mouth once daily.

**How supplied:** 50 mg tablets.

Source: SAMHSA/CSAT, 2009 (TIP 49)

### ***Contraindications***

<i>Condition or Circumstance</i>	<i>Treatment Recommendation</i>
Clients with moderate to severe renal impairment	Carefully monitor (naltrexone is eliminated through the kidneys)
Clients with active liver disease	Monitor liver function frequently
Clients with serum aminotransferase levels > 5 times the upper limit of normal	Generally avoid, unless potential benefits outweigh risks
Pregnant and nursing women and women of childbearing age	Do not prescribe during pregnancy and nursing unless potential benefits outweigh risks*. Caution that effects on fetus are unknown. Encourage use of effective birth control method

Clients with chronic pain or acute or recurring need for opioid analgesics	Have clients abstain from naltrexone for at least 3 days (conservatively 7 days) before initiating opioid analgesics
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\*Oral naltrexone is FDA pregnancy category C. Adequate, well-controlled human studies are lacking, and animal studies have shown a risk to the fetus or are lacking as well. There is a chance of fetal harm if the drug is administered during pregnancy; but the potential benefits may outweigh the potential risk. It is unknown whether oral naltrexone is excreted in human milk.

Source: SAMHSA/CSAT, 2009 (TIP 49)

Treatment outcomes are better if naltrexone is not begun until symptoms and signs of acute alcohol withdrawal have subsided. At least three days of abstinence are recommended, with seven days preferable. Clients experience fewer medication side effects if they are abstinent from alcohol when they begin treatment with naltrexone. It is safe to begin with naltrexone even if clients do not practice abstinence prior to treatment (SAMHSA/CSAT, 2009).

Research results involving oral naltrexone have not been as positive for clients with more severe alcohol dependence or in long-term treatment in outpatient settings. Not surprising, lack of adherence to the medication regimen played a substantial role in the less-than-favorable findings (Douaihy et al., 2013).

### Extended-Release Injectable Form (Vivitrol).

Vivitrol was approved back in 2006 by the FDA for treatment of alcohol addiction (Rubin, 2010). The extended-release form of naltrexone can be taken as a once-a-month depot injection given in a physician's office (CMCS, 2014). It is administered by intramuscular (IM) gluteal injection (SAMHSA/CSAT, 2009). This slow release form of naltrexone has shown efficacy in reducing heavy drinking outcomes because of its increased medication adherence. Studies have further shown its effectiveness in reducing rates of alcohol dependence in the general population. In these studies, the depot form of naltrexone was prescribed and monitored in primary care settings (Douaihy et al., 2013).

**Trade name:** Vivitrol®

**How taken:** 380 mg intramuscular injection once every 4 weeks.

**How supplied:** Single-use cartons, containing the following: one 380 mg vial of Vivitrol microspheres, one vial containing 4 mL (to deliver 3.4 mL) diluent for the suspension of Vivitrol, one 5 mL prepackaged syringe, one 20-gauge ½-inch needle, and two 20-gauge 1.5-inch needles.

Source: SAMHSA/CSAT, 2009 (TIP 49)

### ***Contraindications***

<i>Condition or Circumstance</i>	<i>Treatment Recommendation</i>
History of sensitivity to polylactide glycolide (PLG) polymer, carboxymethylcellulose, or any components of the diluent	Do not administer injectable naltrexone
Anticipated need for opioid analgesics	Do not administer injectable naltrexone

within the next 30 days	
Patient obesity	Do not administer injectable naltrexone if patient's body mass precludes IM injection with the provided 1.5-inch needle Inadvertent subcutaneous injection may cause a severe injection-site reaction

Source: SAMHSA/CSAT, 2009 (TIP 49)

In clinical trials, individuals receiving the 380 mg IM injection of naltrexone (in addition to psychosocial support) demonstrated a 25 percent decrease in heavy drinking days compared to persons receiving placebo. Significant decreases were also found for individuals receiving a lower dose of injectable naltrexone (190 mg). Their decreases were 17 percent compared to persons receiving placebo (SAMHSA/CSAT, 2009).

## Other Promising MATs for AUDs.

Promising results have been shown for *Gabapentin* in treating alcohol dependence (Howland, 2013). Currently approved in the treatment of nerve pain and seizures, persons reporting alcohol dependence who participated in a study from 2004-2010 were better able to stay sober. Further, gabapentin did not produce serious side effects (The Addiction Recovery Guide, 2014). Gabapentin (specifically the 1800-mg dosage) was effective in treating alcohol dependence as well as relapse-related symptoms of dysphoria, insomnia, and craving, with a favorable safety profile (Mason, Quello, Goodell, Shadan, Kyle, & Begovic, 2014).

Another anticonvulsant, *oxcarbazepine* (Trileptal), may also be useful in the treatment of alcohol dependence by reducing alcohol craving. It treats alcohol withdrawal symptoms through an antikindling effect. However, it was not helpful in preventing DTs or seizures (DeSimone, Tilleman, & Powell, 2014). Several studies have suggested its efficacy in improving abstinence and reducing alcohol consumption. However, additional research is needed to confirm the efficacy of oxcarbazepine in the treatment of alcohol dependence (Wilkins, n.d.).

*Ondansetron*, marketed as Zofran in the treatment of vomiting and nausea associated with chemotherapy, has been observed to increase abstinence, decrease alcohol consumption, and stop cravings in people who are early-onset alcoholics. Compared to a placebo group, the persons with early-onset alcoholism treated with ondansetron had fewer drinks per day and they experienced an increase in the number of abstinent days per week (The Addiction Recovery Guide, 2014).

The anticonvulsant, mood-stabilizing medication *Topiramate* (Topamax) has been tested in the reduction of alcohol cravings. It was found to be more effective than a placebo, significantly decreasing obsessive thoughts and compulsions about alcohol use, increasing wellbeing for those treated, and improving some aspects of quality of life. Thus, Topiramate lessened the risk of relapse (The Addiction Recovery Guide, 2014).

Caution is advised with regard to the use of Topiramate in the treatment of pregnant women that use/misuse alcohol. The FDA says that new data indicates an increased risk of cleft palate and/or cleft lip in the exposed fetus (The Addiction Recovery Guide, 2014).

A study found that the muscle relaxant **Baclofen**, marketed as Lioresal or Gablofen, reduced alcohol cravings. In addition, there was evidence that the medication has effectiveness in reducing alcohol consumption as well as inducing abstinence. Though the study was small, the evidence supports Baclofen as a potentially useful medication in the treatment of alcohol dependence.

**Chantix** (varenicline), approved in the treatment of smoking cessation, has been studied as a potential option in the treatment of alcohol dependence. A 2013 study showed individuals treated with Chantix demonstrated significantly lower number of drinks per day, number of drinks per drinking day, weekly percent of heavy drinking days, and alcohol craving compared to a placebo group. It should be noted that Chantix has been linked to a number of serious psychiatric problems including agitation, depression, and suicidal behavior. Other health and safety risks have also been cited, such as seizures, heart attacks, diabetes, falls, and accidents (The Addiction Recovery Guide, 2014).

## Opioids and MAT

Opioids are pain-relieving substances. They reduce the intensity of pain signals reaching the brain, affecting those brain areas by controlling emotion to diminish the effects of the painful stimulus (NIDA, 2011). Opioids slow down the actions of the body, such as heartbeat and breathing, and also affect the brain to increase pleasant feelings (SAMHSA, 2014). Medications falling with this class of substances include: oxycodone (e.g., Percocet, OxyContin), hydrocodone (e.g., Vicodin), morphine (e.g., Avinza, Kadian), and codeine. Hydrocodone products tend to be the most frequently prescribed for painful conditions such as injury-related and dental pain. Codeine is most often prescribed for mild pain. Morphine, on the other hand, is used before and after surgical procedures to alleviate more severe pain (NIDA, 2011). Heroin, once believed to be a wonder drug and replacement for morphine, continues to be a drug of choice for individuals who run short on money for the purchase of prescription opiates. Heroin is less expensive as well as illegal (Narconon International, n.d.).

Opioid dependence is a chronic disorder, often relapsing, that also contributes to major medical challenges such as human immunodeficiency virus (HIV)-related illnesses, hepatitis, and other chronic diseases. It is frequently linked to a history of drug-related criminal activity and persons dependent on opioids often have co-occurring mood disorders, especially depression. Antisocial personality disorder is also more prevalent in persons with opioid dependence than in the general population (Krambeer, McKnelly Jr., Gabrielli Jr., & Penick, 2001).

With wider acknowledgement that opioid dependence should be treated as a chronic disease, medications have been approved by the FDA as effective in treatment (Rinaldo & Rinaldo, 2013). Approved medications include buprenorphine (Suboxone®, Bunavail, Subutex®, and Zubsolv®), methadone, and naltrexone (ReVia®, Vivitrol®, Depade®) (SAMHSA-HRSA/CIHS, 2014). Every recipient of medication-assisted treatment for opioid dependence should also receive psychosocial treatment. Supportive medication monitoring, individual and/or group counseling, and attendance at 12-step/mutual help groups should be part of the assisted-treatment package (Sullivan, 2014). Special weight must be given when considering opioid substitution therapy for pregnant women or adolescents (Chalk et al., 2013). Treatment details for these two populations are provided in their respective sections in this document. On the whole, it has been suggested that MAT is more suitable for users of opioids that meet one or more of the following criteria:

- Poor social support
- Unstable housing and/or lifestyle
- Limited financial resources
- No insurance or less than adequate insurance
- Structure of a dispensing situation that must be attended regularly (Chalk et al., 2013; SAMHSA, 2015).

First steps in the medical management of opioid addiction include 1) use of validated screening tools to identify patients who may have a problem with opioid use and 2) further assessment to clearly delineate the scope of the problem when opioid addiction is identified. Consideration must be given to the appropriate treatment approach when treatment is indicated. Assessment should also identify complicating or comorbid emotional or medical conditions. Complete assessment may take several days but it is not recommended that initial treatment be delayed (SAMHSA, 2004).

Thorough assessment will assist in confirmation of the diagnosis. It is designed to determine need for treatment, develop a treatment plan, and establish a baseline measure for evaluating progress. The assessment should encompass all of the following:

- Confirmation of an opioid use disorder diagnosis;
- Establishment of current opioid use;
- Documentation of substance use history;
- Identification of any need to require medically supervised detoxification from opioids as well as benzodiazepines, alcohol, or other sedatives;
- Determination of where and when such detoxification should be accomplished;
- Identification of comorbid psychiatric and medical conditions and disorders and prioritization and coordination of their management;
- Screening for infectious diseases that place opioid users at elevated risk such as Hepatitis C, Hepatitis B, and human immunodeficiency virus/acquired immune deficiency syndrome (HIV/AIDS) (SAMHSA, 2015).

The American Society of Addiction Medicine (ASAM) announced the release of its National Practice Guideline for the Use of Medications in the Treatment of Addiction involving Opioid Use in early June 2015. A PDF version containing full text is available for download at <http://www.asam.org/docs/default-source/practice-support/guidelines-and-consensus-docs/national-practice-guideline.pdf?search=%22national%20practice%20guideline%20for%20the%20use%20of%20medic%22>. The document can also be found in the *Journal of Addiction Medicine*. The Guideline deals with a number of in MAT topics around opioid use such as the role of drug testing in treatment,

proper duration of buprenorphine treatment, and the growing role of naloxone in reversing opioid overdose. It is intended to help clinicians in managing their clients and clinical decision-making. The Guideline reminds clinicians about informing clients of benefits, risks and alternatives to particular treatments and ensuring their active participation in shared decision making whenever possible (ASAM, 2015).

## Pharmacological Treatments.

Pharmacologic medications used to treat opioid addiction consist of three types: agonists, partial agonists, and antagonists. **Agonists** turn on receptors more slowly and hence have a longer lasting action that helps in the prevention of withdrawal. The effects of **partial agonists** are weaker than those of the full agonists. **Antagonists**, on the other hand, block actions of the receptors. Thus, this blocking action serves to slow or diminish relapse if there is a return to formerly used/misused substances (ONDCP, 2012).

Agonist therapies have proven to be the most effective pharmacological treatments for opioid use disorders (OUDs). Methadone and buprenorphine are the most commonly used agonist therapies. They work by occupying the sites stimulated by opioids and turning on the receptors. Thus, these medications have similar actions to those of the used/misused substance but have different pharmacokinetic profiles. Additionally, agonist treatments are usually provided in combination with psychosocial and/or other support services (Douaihy et al., 2013; Thomas et al., 2014). A large number of studies comparing methadone and buprenorphine have shown that 8 mg of sublingual buprenorphine or 16 mg of the tablet form of buprenorphine per day is equivalent to approximately 60 mg of oral methadone per day (SAMHSA/CSAT, 2005).

A large number of studies comparing methadone and buprenorphine have shown that 8 mg of sublingual buprenorphine or 16 mg of the buprenorphine tablet per day is equivalent to approximately 60 mg of oral methadone per day (SAMHSA/CSAT, 2005).

Use/Misuse of opioids, particularly heroin, is further associated with the transmission of sexually transmitted infections (STIs), hepatitis, human immunodeficiency virus (HIV), and other blood-borne diseases that can result from use of unsterile drug paraphernalia and risky behaviors. Treatment involving MAT then not only helps individuals move away from the vicious cycle of addiction, but can assist in the prevention of related adverse health consequences (NIDA, 2012).

The antagonist naltrexone blocks opioids from acting on the brain and takes away the reward of getting high on the problem opioid. This feature makes naltrexone a good choice for preventing relapse. The medication may be helpful when persons using opioids are completely past withdrawal and highly motivated to stay in recovery. Naltrexone may also be recommended for individuals in an early stage of opioid addiction (SAMHSA, 2012b).

## ***Methadone.***

MMT is one of the most widely used and effective pharmacological methods for treating addictions, especially addiction to opioids. Research on the treatment began for male addicts in 1964 at the Rockefeller Hospital. Women were not admitted into treatment research until 1967 (Kreek, Borg, Ducat, & Ray, 2010).

Methadone is a long-acting, potent opiate agonist used to treat individuals dependent on opioids. It imitates the action of an opiate like heroin by occupying and activating opioid receptors in the body. Its effects last from 24 to 30 hours. Methadone does not generate the extreme euphoria of short-acting, injectables such as heroin because of its slow, very long period of metabolism. Its potency is greater than most other opioids so it produces a physiological tolerance. As a result, individuals should not abruptly stop taking the drug. Neither does methadone provide protection from the use/misuse of non-opioid drugs such as marijuana, cocaine, benzodiazepines, or alcohol (Chalk et al., 2013).

Methadone for opioid addiction can only be administered by opioid treatment programs (OTPs) that are certified by the Substance Abuse and Mental Health Services Administration (SAMHSA) and licensed by the Drug Enforcement Agency (DEA) (Chalk et al, 2013). Persons on methadone maintenance therapy (MMT) are typically required to visit an OTP daily to obtain their dose of

**Methadone for opioid addiction can only be administered by appropriately licensed and certified opioid treatment programs (Chalk et al., 2013).**

medication under direct clinical observation. A significant history of stabilization should be established for persons on MMT to receive take-home doses (Chalk et al., 2013).

If an individual is deemed eligible for admission to a MMT program, the following should be completed by program staff members:

- Comprehensive physical evaluation prior to admission
- Laboratory workup as indicated
- Psychosocial assessment
- Preliminary treatment plan
- Client orientation during the initial stage of treatment (SAMHSA, 2015).

Usual dispensation of methadone involves daily doses at a methadone treatment facility. It is possible for persons to become eligible for take-home doses based on lack of known criminal activity, absence of behavioral problems at the clinic or recent substance use/misuse, appropriate clinic attendance, and evidence of a stable home life with the ability to safely store the methadone (Fullerton et al., 2014).

Methadone treatment predicts lower risk of infection from the human immunodeficiency virus (HIV), a blood-borne infection that is sometimes linked to intravenous drug use. Research has shown that, while in methadone-maintenance treatment (MMT), individuals use significantly less than they did before they started treatment. Persons in MMT also use less frequently than individuals not in treatment (Chalk, et al., 2013; Lawrinson et al., 2008). Methadone treatment has been recognized as an effective tool in increasing adherence to antiretroviral therapy in people with HIV/ acquired immune deficiency syndrome (AIDS) (World Health Organization [WHO], 2011). The methadone dosage may need to be adjusted when treating persons with HIV because some of the medications developed to treat the infection can accelerate or retard the body's transformation of methadone. In all instances, it is important to develop a full listing of medications being taken by the individual to treat HIV. Another primary concern of methadone treatment is the high relapse rate associated with withdrawal from use, even following long periods of maintenance (Chalk et al., 2013).

In regard to dosing, it is recommended to start low and go slow (i.e., use the safety principle) for early medication dosages in outpatient settings (SAMHSA, 2005). The ASAM Guideline recommends initial dosing of 10 to 30 mg, with reassessment in three to four hours. The second dose should not exceed 10 mg on the first day if withdrawal symptoms are continuing (ASAM, 2015). According to a consensus panel, programs should monitor and adjust patient dosages to ensure they receive therapeutic amounts of medication without regard to arbitrary dose-level ceilings that are not supported by research evidence. (The panel's recommendation applies across all opioid treatment medications.) Decisions regarding dosages should be appropriate and tailored to each patient. Dosages lower than those recommended by the manufacturer may be sufficient for the desired therapeutic effect in many cases, especially when patients have a positive diagnosis for cardiac risk factors (SAMHSA, 2005).

In the first week of treatment, dosage adjustments should be based on how patients feel at the peak period for their medication (e.g., 2-4 hours following a methadone dose has been administered), not on how long the effects of the medication last. About 60 mg has been accepted widely as the low end of effective for most patients. However, other patients may require much more for optimal effect, even higher than 120 mg per day. There is some evidence that patients receiving more than 200 mg of methadone per day can have optimal results with no adverse effects. Nevertheless, treatment providers should be more cautious when providing higher doses, especially as take home, because of possible increased diversion potential. Research has indicated patients with hepatitis C or mental disorders comorbid with their opioid use disorder may need increases of 50 percent or more in methadone dosage to achieve stabilization. Lower doses have been shown to be less effective in facilitating abstinence in patients addicted to heroin (SAMHSA/CSAT, 2005).

Recent research on MMT continues to support its effectiveness. For example, the literature continues to show that methadone is more effective than no medication treatment in the reduction of illegal opioid use and retention in treatment. Even when compared with treatments offering no opioid replacement therapy, such as drug-free rehabilitation protocols or detoxification protocols, methadone was significantly more effective in suppression of heroin use (as measurement by urine drug testing) and treatment retention. Similar findings have been demonstrated for individuals receiving interim methadone treatment, which is treatment under daily supervision while the person is awaiting placement in a standard methadone program, compared to just being on a wait list. There has also been some support that MMT reduces substance-related risk factors such as the sharing of injection paraphernalia (Fullerton et al., 2014).

In general, research has shown that higher doses of methadone, i.e., greater than 60 mg, are associated with less heroin use during treatment, fewer withdrawal symptoms, better treatment retention and enhanced abstinence from cocaine (Fullerton et al., 2014; Thomas et al., 2014). MMT has its drawbacks too. The medication can be fatal in overdose and increase risk of severe liver disease if clients continue to use other substances such as alcohol, benzodiazepines, and barbiturates while on MMT. In addition, there is the potential for diversion to illicit trafficking, though there are very strict Federal and state regulatory requirements for OTPs and their clients (Douaihy et al., 2013).

Switching from methadone to another medication in the treatment of opioid use is not recommended unless the client is experiencing intolerable side effects or there is a lack of success in attaining or maintaining treatment goals. It is further recommended that clients switching to buprenorphine from methadone be on low methadone doses at the time of the switch, i.e., 30-40 mg per day or less. Otherwise the client may experience significant discomfort from the medication switch. Switching to oral naltrexone or the extended-release injectable from methadone requires that the client be completely withdrawn from methadone and/or other opioids (ASAM, 2015).

Compared to buprenorphine maintenance, MMT appears to be more effective in retaining people in treatment, particularly if the buprenorphine is prescribed in a flexible dose regimen or at a fixed and low dose (2 - 6 mg per day) (Mattick, Breen, Kimber, & Davoli, 2014). However, some studies have found MMT to be no more effective than nonmedical approaches such as NA over time. Results of one study showed that the MMT group did not differ from the NA group on key outcome variables, i.e., alcohol, barbiturate, and cocaine use or on retention rate. In addition, a substantial proportion in each group failed to return to their illicit substance use during treatment. The prevalence of benzodiazepine misuse and cigarette smoking, however, was lower in the MMT group than for the NA group. Nevertheless, results from this study support abstinence therapies rather than MAT in producing positive outcomes over the long term for persons with opioid use disorders (Khodabandeh et al., 2012).

## *Buprenorphine.*

FDA approval of buprenorphine provided another evidence-based MAT option for people with opioid dependence and research findings are primarily favorable (Douaihy et al., 2013). Buprenorphine can be administered at OTPs like methadone but was approved to have administration provided by physicians in office-based settings (Chalk et al., 2013). As required by Federal law, physicians that prescribe buprenorphine must have special certification, meeting designated qualifying requirements, and additionally notify the Secretary of Health and Human Services of their intent to prescribe buprenorphine in the treatment of addiction to opiates. Once certified, the physicians must affix the unique identification number on every buprenorphine prescription they write. The physicians further receive a waiver from the Drug Enforcement Administration (DEA) to provide treatment for opioid dependence in their office for not more than 100 persons at a time (SAMHSA, n.d.). In 2016, the number of patients that can be treated with buprenorphine by certified physicians was increased to 275 in the third year. A waiver to that effect must have been requested and the physicians must have additional credentialing in addiction medicine or addiction psychiatry from a specialty medical board and/or professional society, or practice in a qualified setting as described in the rule (ATForum, 2016). The final rule will be effective as of August 8, 2016 (ASAM staff, 2016).

Buprenorphine is a long-acting (up to 48 hours), high-affinity, partial mu opioid agonist. Thus, it acts as a functional antagonist blocking the effects of pure mu agonists. Because it is a partial agonist, buprenorphine is safer in overdose. Its ceiling effect results in less respiratory depression. (Methadone, on the other hand, is a pure mu agonist.) Moreover, buprenorphine's euphoric effect is considered more diminished than methadone's, thereby making it less likely to be diverted (Douaihy et al., 2013). A partial opioid agonist, buprenorphine is available in both film and tablet formulations (Federation of State Medical Boards, 2013). Two forms were approved by the FDA in the treatment of opiate addiction in 2002, Subutex (buprenorphine hydrochloride) and Suboxone (buprenorphine combined with naloxone) (FDA, 2002; Partnership at Drugfree.org, 2002). These medications became the first medications approved under the Drug Abuse Treatment Act (DATA) of 2000 and for office-based treatment of opioid dependence in this country (Thomas et al., 2014). The "mono" product, buprenorphine alone (Subutex), might also be called "bup" or "buprenorphine mono-formulation (ONDCP, 2012) and has high abuse/diversion potential. As a consequence, the "mono" product should not be prescribed for unsupervised administration unless there are extenuating circumstances. The combination product, buprenorphine/naloxone (Suboxone), has minimal abuse potential. "Mono" and combination buprenorphine products can be administered sublingually (CMCS, 2014; FDA, 2002). Induction should start with a dose of two to four mg, with increases as needed in increments of two to four mg (ASAM, 2015). **The typical**

maintenance dose for Suboxone ranges from 12 mg to 16 mg. Doses higher than 16 mg may be useful on rare occasions but a thorough re-evaluation of the client's treatment needs would be required (Douaihy et al., 2013). Dosing based on reported substance use can be very helpful in targeting eventual final doses of buprenorphine (DVHA/VDH/ADAP, 2012). The table below presents suggested dosing targets;

**Table 1. Suggested Guide for Dose Targets**

<b><u>Buprenorphine</u></b> <b><u>Doses</u></b>	<b><u>Oxycodone</u></b>	<b><u>Morphine</u></b>	<b><u>Heroin</u></b>	<b><u>Methadone</u></b>
2 mg	30 mg	60 mg	<u>1-2 bags</u>	10 mg
4 mg	60 mg	120 mg	<u>3 bags</u>	20 mg
6 mg	90 mg	180 mg	<u>4 bags</u>	30 mg
8 mg	120 mg	240 mg	<u>6 bags</u>	40 mg
12 mg	180 mg	360 mg	<u>8 bags</u>	60 mg
16 mg	240 mg	480 mg	<u>10 bags</u>	80 mg

*Source:* DVHA/VDH/ADAP, 2012

As a partial agonist that is less potent than methadone, buprenorphine is further deemed as much safer when taken in the manner prescribed. Moreover, there are fewer side effects with buprenorphine compared to methadone (Chalk et al., 2013; The Partnership for Drugfree.org, 2002).

There are fewer side effects with buprenorphine compared to methadone (Chalk et al., 2013; The Partnership for Drugfree.org, 2002).

Generic forms of buprenorphine

were approved by the FDA in 2013 (Chalk et al., 2013). If administered too soon after use of an opioid

agonist, buprenorphine can exacerbate withdrawal symptoms. Administration should not occur until at least 12 hours following use of any short-acting opioids and 36 hours following use of methadone (Chalk et al., 2013). Due to the greater vulnerability of the tablet form to diversion and nonmedical use than the sublingual film, the patent-holding company submitted a request to the FDA to eliminate tablet formulations from the market (Federation of State Medical Boards, 2013).

On February 25, 2013, the first two generic versions of Suboxone (Bup/Nx) were approved by the FDA. Initially prices for the brand name and generics were not substantially different. However, prices were expected to drop as more competitors entered the market. The generic version of the sublingual tablets was marketed as Zubsolv. The generic film was marketed as Bunavail (NAABT, 2015). **Probuphine® was recently approved by the FDA on May 26, 2016.** Additional study was required because there were particular concerns about insertion and removal of the implant. As designed, the implant is the "first and only commercialized maintenance treatment for opioid dependence in individuals who have sustained clinical stability on low-to-moderate doses of buprenorphine, i.e., eight mg or less a day. The implants can only be provided by specially trained, certified healthcare providers. Probuphine® **has been available to patients since June 2016.** A six-month course of treatment will cost \$4,950. However, the company says a payment assistance program will be put in place to ensure access to Probuphine® for patients (Braeburn Pharmaceuticals, 2016). Buprenorphine, currently available in sublingual tablet and oral formulations, had annual sales in 2012 in the U.S of about \$1.5 billion (Poland, 2015). Production ceased for the brand name buprenorphine tablet formulation in March 2013 due to safety concerns related to possible pediatric ingestion of the tablets (Chalk et al., 2013).

Physicians that prescribe buprenorphine must complete special training in order to qualify for the Drug Enforcement Administration (DEA) prescribing waiver (Chalk, 2012; TBME, 2012). As of May 11, 2016, there were 400 physicians listed as certified to prescribe buprenorphine in the State. Physicians decide whether or not they want to be listed in the locator so the number is likely an underestimate. (See the Buprenorphine Physician & Treatment Program Locator at [http://buprenorphine.samhsa.gov/bwns\\_locator/](http://buprenorphine.samhsa.gov/bwns_locator/)). Buprenorphine treatment programs are authorized under 21 United States Code (U.S.C.) Section 823 (g)(1) to dispense medications. The code gives no authorization to the programs for prescribing. Further, programs registered under 21 U.S.C. Section 823 (g)(1) are not subject to client limits (SAMHSA, n.d.).

A Federal rule change, effective January 7, 2013, modified the dispensing requirements of buprenorphine products for opioid dependence as used in Federally certified and registered opioid treatment programs (OTPs). The rule provides more flexibility in dispensing take-home products by removing restrictions on the time an individual needs to be in treatment in order to receive take-home supplies. OTPs will continue to adhere to all other Federal treatment standards established for methadone (Federal Register, 2012). Nevertheless, OTPs are still required to assess and document each patient's responsibility and stability to handle opioid drug products for unsupervised use. In addition, buprenorphine products may be prescribed to OTP patients by an OTP physician that has a DATA 2000 waiver as long as the physician adheres to his or her patient limits (SAMHSA, 2015).

Buprenorphine doses studied for opioid addiction treatment range from a low of 1–2 mg to as much as 16–32 mg, depending upon the formulation (solution versus tablet), with treatment duration lasting from a few weeks to years (SAMHSA/CSAT, 2004). Research shows that buprenorphine clients in outpatient settings stay in treatment longer (Chalk et al., 2013). When buprenorphine is prescribed at fixed doses (i.e., greater than seven mg per day), treatment retention or suppression of illicit opioid use was not different from methadone prescribed at fixed doses (i.e., 40 mg or more per day) (Mattick, Breen, Kimber, & Davoli, 2014). Moreover, buprenorphine clients experience more rapid resolution of withdrawal symptoms to persons treated through MMT (Chalk et al., 2013). Nevertheless, there is no difference in treatment completion or severity of withdrawal for persons treated with buprenorphine compared to MMT (Chalk et al., 2013). As an additional note, buprenorphine treatment, like methadone, has been recognized as an effective tool in increasing adherence to antiretroviral therapy in people with HIV/AIDS (World Health Organization [WHO], 2011).

Ideally, buprenorphine should be discontinued when an individual has achieved the maximum benefit from treatment and no longer requires continued treatment to maintain a substance-free lifestyle. However, discontinuation should be tapered rather than instituted abruptly. Abrupt discontinuation will result in withdrawal symptoms (SAMHSA/CSAT, 2004). Furthermore, individuals should be well-stabilized before honoring client requests to withdraw from the buprenorphine medication (DVHA/VDH/ADAP, 2012; Ling et al., 2009).

Ling et al. (2009) studied long and short tapers after buprenorphine stabilization on participant outcomes, as measured by opioid free urine tests at the end of each taper period. A long taper comprised 28 days while a short taper consisted of seven days. Data were collected at the end of weekly visits for services, and at one- and three-month follow-ups. Findings provided evidence that clients stabilized on a range of buprenorphine doses can be tapered successfully over seven days. This study indicates a lack of advantage in prolonging the buprenorphine tapering schedule for

weeks (DVHA/VDH/ADAP, 2012; Ling et al., 2009). Table 2 below displays a suggested buprenorphine taper regimen for a seven-day period of time.

**Table 2. Suggested Buprenorphine 7-Day Taper Regimen**

Stabilization Dose*		8 mg	16 mg	24 mg
Day				
1		8	16	24
2		6	12	20
3		6	10	17
4		4	8	12
5		4	4	8
6		2	2	4
7		2	2	2
8		0	0	0

Source: DVHA/VDH/ADAP, 2012

A study by Nielsen, Hillhouse, Thomas, Hasson, & Ling (2013) compared outcomes for users of prescription opioids (PO) versus users of heroin under taper conditions of seven or 28 days, with one- and three-month follow-ups, after buprenorphine stabilization. Results were consistent with the Ling et al. (2009) study. There appears to be no benefit in prolonging the taper period beyond seven days for either group of substance users. The greatest distinction between the groups seemed to be the dosages they were stabilized on. Users of PO tended to be stabilized on buprenorphine dosages not higher than 16 mg, whereas users of heroin tended to require 24 mg for stabilization.

If a patient on methadone wants to switch to buprenorphine, the methadone dose should be tapered to not more than 30 mg per day for a minimum of one week before initiating the buprenorphine induction treatment. The first dose of buprenorphine should be 2 mg of the monotherapy formulation and should not be received until at least 24 hours after the last methadone dose (SAMHSA/CSAT, 2004). No time delay is recommended when switching from buprenorphine to methadone. This switch involves the addition of a full mu opioid agonist to a partial agonist which typically does not result in adverse reactions. When switching to naltrexone from buprenorphine, a period of seven to 14 days should elapse between the last dose of buprenorphine and the start of naltrexone. This delay helps to ensure that the client is not physically dependent on opioids prior to starting naltrexone (ASAM, 2015).

Best practice says office-based treatment of opioid dependence requires prescribing of only FDA-approved medications. This means only buprenorphine/naloxone sublingual (s.l.) film, buprenorphine s.l. tablets, or monoprodukt s.l. tablet. No other substances or buprenorphine formulations have been approved for this use. It is further not advisable to administer large prescriptions of buprenorphine/naloxone early in treatment. For example, it is not recommended to give more than a week at a time in the first months until the recipient has stabilized and stopped opioid and/or other substance use. Additionally, the recipient should have demonstrated regular treatment attendance and a check of the controlled substance database should confirm no other prescribers and no evidence of other controlled substance prescriptions (Sullivan, 2014).

Several researchers have further examined buprenorphine treatment outcomes across users of different types of opioids. Moore et al. (2007), e.g., compared outcomes among 200 clients who

reported exclusive use of heroin, use of heroin and prescription opioids, or strictly use of prescription opioids. Demographically, prescription-opioid-only users tended to be younger, have less years of opioid use, and less drug treatment history than heroin-only users. They were also likely to be white, less likely to have Hepatitis C, and have higher incomes. Compared to the heroin-only users, prescription-opioid-only users remained in treatment longer, had a higher percentage of opioid-negative urine samples, and were more likely to complete treatment than heroin-only users. Combination opioid users (heroin and prescription) demonstrated outcomes intermediate between the prescription-opioid-only and heroin-only users (Moore et al., 2007).

Buprenorphine has been shown to work well with pregnant women. Thomas et al. (2014) reviewed 16 adequately designed randomized controlled trials of buprenorphine maintenance treatment (BMT), in addition to seven meta-analyses. These researchers noted improved outcomes for individuals and pregnant women with opioid use disorders compared with placebo (Thomas et al., 2014). Breastfeeding can be considered in pregnant women treated with buprenorphine, depending on individual risk factors (Soyka, 2013).

Research comparing buprenorphine maintenance to tapering for treatment retention is also underway. Results of a randomized clinical trial carried out in primary care settings between February 2009 and February 2013 showed better treatment retention and reduced illegal use of opioids for maintenance versus the taper group. A larger proportion of opioid-positive urine samples were also provided by the taper group also provided (Fiellin et al., 2014). More positive results for buprenorphine tended to occur when there were comparisons to a placebo. Methadone appeared to be better suited over buprenorphine for clients with very severe addiction (Douaihy, 2013).

### **Naltrexone.**

Naltrexone was first developed as treatment for addiction to opioids in 1984. It works by displacing any opioids from a user's opioid receptors and then tightly binding to those receptors for an extended period of time, which makes the receptors unavailable for activation by any self-administered opioid such as heroin (Chalk et al., 2013). To begin naltrexone treatments, however, individuals must have instituted a period of abstinence from opioid use. If a patient has failed to abstain from all opioid use (legal and/or illicit) for a period between seven and 10 days, , administration of naltrexone will produce immediate opioid withdrawal (Chalk et al., 2013; SAMHSA, 2012a). Naltrexone can be taken as a once-a-month injection given in a physician's office or orally in tablets (CMCS, 2014). When taken at a stable dose following detoxification, individuals will no longer experience euphoric effects from use of opioids such as heroin or prescription drugs (Chalk et al., 2013). Naltrexone does not imitate the effects of opioids (ONDCP, 2012). People are less likely to drop out of treatment with naltrexone when there are powerful external motivators, such as the likelihood of losing an important job, upon which adherence is contingent. Having

family members involved in monitoring adherence is also very helpful. The medication seems to be particularly useful for highly motivated individuals that have appropriately detoxed and desire a faster detoxification schedule or need additional support to avoid relapse (Chalk et al., 2013).

Any switching to methadone or buprenorphine should be planned, considered, and monitored. The switching process should not be complicated but a time delay is required. It is recommended that clients on oral naltrexone wait a single day prior to switching and those receiving the extended-release formulation not to switch for 30 days (ASAM, 2015).

Drug interactions have been reported when naltrexone is used in conjunction with other medications. For example, the side effects of somnolence and lethargy have been reported when naltrexone is used with some antipsychotic medications such as thioridazine or chlorpromazine. Naltrexone has not been approved by the FDA for treatment of opioid dependency in persons younger than 18 years of age (Chalk et al., 2013).

Caution should further be taken regarding use of naltrexone with pregnant women, breast-feeding women, or women who become pregnant while on naltrexone therapy. Naltrexone is classified as a B3 risk in pregnancy which means that its effects on the fetus are not known. Either animal studies have not shown a clear risk or no adequate, well-controlled studies have been conducted involving pregnant women. Caution is also recommended when the person using opioids is a polydrug user or has depression or other major psychiatric illness (Chalk et al., 2013).

### *Oral Naltrexone.*

Oral naltrexone, approved by the United States Food and Drug Administration (FDA) in the treatment of opioid addiction in 1984, binds to opioid receptors in the body for 24-30 hours (Chalk et al., 2013). A seven to 10-day abstinence period is required prior to beginning naltrexone therapy, to avert withdrawal, relapse, or early dropout. After detoxification (i.e., withdrawal management) has been accomplished or established, stable doses of naltrexone can be administered. Neither withdrawal symptoms nor abuse potential is associated with naltrexone use. The medication has no narcotic effect. Tolerance has been tested and results showed negative even after many months of regular use. Naltrexone is sold under one of the following trade names: Depade®, Trexan®, and Revia® (Chalk et al., 2013; Tetrault & Fiellin, 2012).

While effective, use of this form of naltrexone is plagued by the fact that many clients fail to adhere to the treatment regimen. Research has shown that 50 to 70 percent of persons prescribed oral naltrexone discontinues use (Chalk et al., 2013).

Because Naltrexone blocks the effects of opioids, it is sometimes prescribed for 12 months for those trying to manage drug dependence (about.com, 2014). Its administration is not linked to the development of dependence or tolerance (Drugs.com, 2005). Supplied in 25, 50, and 100 mg tablets (SAMHSA/CSAT, 2005), research indicates that 50 mg of Naltrexone will block the pharmacologic effects of 25 mg of intravenously administered heroin for up to 24 hours. Additional data have suggested that doubling the Naltrexone dose provides blockade for 48 hours and that tripling the dose provides blockade for about 72 hours. A flexible approach to a dosing regimen has been suggested in an effort to enhance adherence. For example, patients may receive 50 mg every weekday and a 100 mg dose on Saturday or they may receive 100 mg every other day, or 150 mg every third day. Several studies have employed the following dosing regimen: 100 mg on Monday,

100 mg on Wednesday, and 150 mg on Friday. This dosing schedule has been shown to be acceptable to many patients striving to maintain their opioid-free state successfully (Drugs.com, 2014). This dosage regimen is recommended in the ASAM Guideline as well (ASAM, 2015).

There have been many trials of oral naltrexone in the treatment of opioid dependence and results show elimination of opioid use among those who adhere to the medication. However, adherence to or outright discontinuation of oral naltrexone is a big problem. Research shows 50-70 percent of persons that have been prescribed oral naltrexone for opioid dependence either discontinue using it or fail to take it as prescribed. Adherence is extremely important because the blocking action of oral naltrexone lasts no longer than 24-36 hours, on average. Thus, a missed dose may result in relapse, which would require new detoxification and naltrexone induction. It is believed that the seven to 10-day abstinence-from-opioid-use requirement prior to beginning naltrexone induction contributes

Successful candidates for oral naltrexone have included medical professionals, other persons with their employment in jeopardy, and people in the criminal justice system (Kjome & Moeller, 2011).

to the poor adherence and early drop out (Chalk et al., 2013). Nevertheless, oral naltrexone has shown to be particularly useful when motivation to abstain is high. It works very well for patients who are closely monitored and have much to lose from being exposed

as having relapsed to opiate use (Minozzi et al., 2011). Successful candidates have included medical professionals, other persons with their employment in jeopardy, and people in the criminal justice system, (Kjome & Moeller, 2011). The medication is reported to be of greatest use for persons who take the drug as part of a comprehensive occupational rehabilitative program, behavioral contract, or other compliance-enhancing protocol. While Naltrexone will not reinforce medication adherence, it is expected to have a therapeutic effect when given under external conditions that support continued use of the medication (Drugs.com, 2014).

### *Extended-Release Injectable Form (Vivitrol).*

Unlike the oral naltrexone, buprenorphine, and methadone, the extended-release injectable form of naltrexone (Vivitrol) allows people addicted to opioids to take the effective medication once a month versus every day. It was approved in October 2010 by the FDA for treating individuals dependent on opioids. Research supports its effectiveness, producing equally significant reductions in the use of opioids throughout a full month's injection period. In addition, research shows that between 35 to 50 percent of Vivitrol users voluntarily return for their continued monthly injections (Chalk et al., 2013). Vivitrol has shown to be more effective when provided in conjunction with behavioral therapies and social supports (SAMHSA, 2012a).

In addition to having a different frequency of administration, extended-release injectable naltrexone (Vivitrol) has a different route of administration, different restrictions on prescribing/dispensing, different abuse and diversion potential, and no additional requirements, compared to methadone and buprenorphine. This form of naltrexone binds to opioid receptors for up to 30 days (Chalk et al., 2013).

Vivitrol is administered monthly instead of daily like buprenorphine and methadone. Moreover, the drug is injected intramuscularly by an appropriate health care professional, i.e., any person who is licensed to prescribe medicine (SAMHSA, 2012a). It is recommended that injections be

administered in alternating buttocks over the course of treatment. Missed doses should be administered as soon as possible (Krupitsky, 2012). Unlike buprenorphine and methadone, Vivitrol is not an opioid and does not have abuse potential (SAMHSA, 2012a). It is a long-acting form of naltrexone that blocks opioids (Rubin, 2010).

Because Naltrexone displaces the opioids of abuse by binding to those receptors, complete detoxification from opioids is required in advance of initiating or resuming treatment with the extended-release injectable.

Otherwise, the individual will likely

go through intense withdrawal. A minimum of seven to 10 days without opioid use is recommended prior to beginning extended-release injectable naltrexone (Vivitrol) (Krupitsky, 2012; SAMHSA, 2012a).

Because Naltrexone displaces the opioids of abuse by binding to those receptors, complete detoxification from opioids is required in advance of initiating or resuming treatment with the extended-release injectable (Krupitsky, 2012, e.g.).

The standard dosage is 380 mg and is not affected by age, weight, or other factors (ASAM, 2015; SAMHSA, 2012a). This means that a 60 year old and a 30 year old would receive the same dosage, e.g. The FDA has not yet approved the use of Vivitrol for persons younger than the age of 18 (SAMHSA, 2012a). It may be possible that clients taking the oral form of naltrexone want to switch to the injection. The writer did not locate any systematically collected data that specifically addressed this issue or whether precautions should be taken (Vivitrol.com, 2013).

A study using claims data from a large health plan in this country examined benefits of extended-release naltrexone in comparison to other medications for opioid dependence. The analysis focused on six-month medication persistence, health care utilization, opioid-related and nonrelated inpatient admissions, detoxification and rehabilitation, outpatient services, and total costs. Total healthcare costs for extended-release naltrexone were not significantly different from buprenorphine or oral naltrexone and were 49 percent lower than for methadone, despite the higher pharmacy costs for this medication. Further, patients treated with extended-release naltrexone further had fewer opioid-related and nonopioid-related hospitalizations, compared to patients receiving any of the FDA-approved oral medications for opioid dependence (Baser, Chalk, Fiellin, & Gastfriend, 2011).

People in the following categories have been deemed good candidates for the extended release injectable form of naltrexone.

- Failed in their methadone or buprenorphine treatment.
- Reported or demonstrated a high level of motivation to achieve and maintain abstinence from opioids.
- Presented with brief and/or less severe history of dependence on opioids.
- Currently facing periods of intense relapse risk into opioid dependence including greatly increased stress.

- Indicated a preference to receive treatment for opioid dependence in an office-based, primary care setting rather than in treatment centers or specialty clinics.
- Expressed desire to reduce the amount of time spent going to daily visits at an OTP (SAMHSA, 2012a).

### *Precautions.*

Physicians should educate clients who are being treated with medications containing naltrexone. In particular, physicians should provide information about mortality risks that exist during and upon discharge from treatment for opioid dependence. Behavioral health professionals and other social supports, such as family and friends, have an important role in reminding individuals in treatment of these risks as well. In general, persons treated with extended-release injectable naltrexone should:

- Wear medical alert jewelry or carry some form of identification so emergency personnel can provide safe and appropriate care involving pain management when the client is unconscious or cannot otherwise communicate (SAMHSA, 2012a).
- *NOT* take naltrexone if they are female and are breast feeding or pregnant (SAMHSA, 2012b).
- Take necessary precautions with naltrexone in the home. Keep it locked in a safe place at all times to prevent its accidental use by others, especially children (SAMHSA, 2012b).
- *NOT* use other opioid medications when taking naltrexone. Naltrexone blocks the effects of opioids, thus preventing those medications from working (SAMHSA, 2012b).
- *NOT* use alcohol, illicit drugs, or drugs that slow breathing while taking naltrexone. The combination of naltrexone and other substances, especially when taken in large amounts, can result in death or overdose (SAMHSA, 2012b).

There are 18 states that require documentation of the use of injectable naltrexone and 20 states plus the District of Columbia that require documentation of behavioral therapy with buprenorphine-naloxone use. It is recommended that care be taken in ensuring that such requirements are not unduly burdensome and consequently limit appropriate access to pharmacotherapy as an effective treatment for opioid use and other substance use disorders (CMCS, 2014).

## **Barriers to Medication-Assisted Treatment (MAT)**

The continued negative health outcomes stemming from alcohol and nicotine use, in addition to the dramatic increase in heroin and other opioid-related overdoses point to the need for greater access to substance use treatment medications. Moreover, MAT for SUDs has proven to be cost effective,

clinically effective, and to significantly reduce use of detoxification and in-client services. Yet medication-assisted treatment (MAT) is underutilized and access remains limited. A 2011 study found fewer than 30 percent of contemporary substance use treatment programs offer medications and less than 50 percent of eligible clients in the programs actually receive medications (SAMHSA-HRSA/CIHS, 2014). Among the factors identified as contributors to the low use of MAT options include:

- Agency regulatory policy that forbids or restricts the use of MAT;
- “Fail first” criteria that requires trial of other therapies first;
- Lack of available prescribers;
- Lack of support for existing prescribers;
- Limits on prescribed dosages;
- Minimal coverage for counseling; and
- Workforce misunderstandings and attitudes about the nature and use of medications in substance use treatment (SAMHSA-HRSA/CIHS, 2014).

Financing and reimbursement barriers at the state level have also been identified. A small three state, six-site pilot project facilitated development of several solutions and policy opportunities (SAMHSA-HRSA/CIHS, 2014).

Research has shown limited adoption of MAT by SUD treatment organizations, particularly in programs that rely heavily on governmental sources of funding. This finding suggests that clients in publicly funded substance-use treatment settings are less likely to have access to evidence-based programs (EBPs) relative to those receiving care from privately financed systems (Knudsen, Abraham, & Oser, 2011).

## Conclusion

Abstinence from substance use disorders (SUDs) can be very challenging and MATs can help. MATs are proven evidence-based practices in the treatment of substance use disorders (SUDs) that assist in weaning people off their substances of use/misuse and make the withdrawal process more tolerable. These medications tend to suppress the user’s desire to use while, in most cases, still providing a euphoric effect. Similar to most medications, MATs have a long list of potential side effects and present dangers if they are not properly used. Further, they can become a crutch for the user; several of the medications have abuse potential. Equally important, MATs treat only part of the problem. They do not address the traumatic or emotional issues that may have led to the substance use/misuse in the first place. MATs are supposed to be accompanied by counseling and recommendations for attendance at mutual help groups such as NA. Unfortunately, many patients fail to adhere to the counseling/self-help component of MAT (Camp, 2015).

The highest levels of use of medication-assisted treatments have been reported by privately funded treatment programs. As expected, the lowest levels of adoption of MAT protocols were demonstrated in publicly funded programs (Roman et al., 2011).

## Psychosocial Treatments

Evidence-based (EB) psychological treatments exist for treating some substance use disorders (SUDs). Treatments are defined as EB based on criteria outlined by Chambless et al. (1998) according to criteria requiring treatments to be efficacious in randomized controlled trials (RCTs) or their logical equivalents. Only studies based on RCTs or their logical equivalents afforded strong causal inferences. Criteria to support the research of identified treatments are shown below:

Status	Criteria
Strong	Support from two well-designed studies conducted by independent investigators
Modest	Support from one well-designed study or several adequately designed studies
Controversial	Conflicting results, or claims regarding mechanisms are unsupported

Source: APA/Div12, 2016.

EB treatments have been found to be effective for dependence on the following substances:

### For Use of Mixed Substances

***Motivational Interviewing*** (strong research support) – Motivational Interviewing (MI) is a brief person-centered clinical method for strengthening clients' motivation for and commitment to change. It is particularly indicated for clients who are ambivalent, reluctant, or defensive about change. Strongly rooted in the work of Carl Rogers, the overall spirit of MI is collaborative and empathic. It typically involves one to four sessions. Rather than working from a deficit model in which the therapist provides what the client is missing (e.g., skills, insight, knowledge), MI seeks to evoke the client's own strengths, motivations, and resources. In MI, particular attention is paid to specific aspects of client speech that predict subsequent change. The therapist elicits and explores the client's own reasons for change within an atmosphere of acceptance to minimize resistance and defensiveness.

MI therapists use diverse strategies to evoke and strengthen clients' "change talk." There are specific guidelines for deciding what questions to ask, and what content to reflect and summarize. Studies have demonstrated that therapists adhering to MI-consistent skills are able to significantly increase client change talk, which in turn predicts behavior change outcomes. Therapists learning MI typically begin by developing a strong foundation of client-centered counseling skills (reflective listening, open questions, affirmation, summaries), and then learn to identify, evoke, and strengthen client change talk using these skills strategically (APA/Div12, 2016).

***Motivational Enhancement Therapy*** (MET) (strong research support) – Motivational Enhancement Therapy (MET) employs motivational interviewing along with assessment and personalized feedback. It has been observed to be particularly helpful for less-ready clients, where the initial task is to develop ambivalence about change. It is designed to help the individuals resolve ambivalence regarding his or her use of substances. Identification and alteration of thoughts and behaviors that promote the substance use is the focus of cognitive-behavioral coping skills therapy. The person is educated about the model, collaborating with the therapist to identify and use different thoughts and behaviors and using role-plays and behavioral rehearsals. Homework opportunities are typically provided through this model as well. The community reinforcement approach is a comprehensive cognitive-behavioral approach that focuses on aspects of the person's environment that either supports or hinders his or her substance use. Many techniques are incorporated including teaching new coping skills, involving significant others, and conducting a functional analysis of the substance use. These techniques are designed to assist the individual in creating a reinforcing sober lifestyle (APA/Div12, 2016; Borsari et al., 2011).

***MET plus Cognitive Behavior Therapy*** (strong research support) – Motivational Enhancement Therapy (MET)/Cognitive-Behavioral Therapy (CBT). Initial sessions employ MET in an effort to elicit intrinsic motivation to change substance use/misuse by resolving the person's ambivalence. The CBT component follows, focusing on helping the individual to become abstinent (Chambers et al., 2013). Based on the notion that thoughts cause behaviors and determine the way in which people perceive, interpret, and assign meaning to their environment, the CBT component encourages individuals to examine the pros and cons of their use/use and to create goals that will help them achieve a healthier lifestyle (APA/Div12, 2016; Winters, Botzet, & Fahnhors, 2011).

***Prize-Based Contingency Management*** (strong research support) – The Contingency Management (CM) component is a structured behavioral therapy that involves frequently monitoring the behavior targeted for change, then reinforcing the behavior each time it occurs using tangible, escalating reinforcers. Drug use behavior is typically the behavior targeted for change, but other behaviors such as treatment attendance can also be reinforced. Individuals are reinforced for submitting drug negative urine samples or attending treatment by earning the chance to win prizes ranging from \$1 to \$100 in value—hence, the prize-based component. Chances to win prizes increase with sustained abstinence or attendance.

Generally CM treatments are in effect for 8-24 weeks and provided as an adjunct to other treatment. It can be integrated with virtually any form of therapy, including CBT, community reinforcement approach therapy, eclectic/standard group treatment, 12-step therapy, motivational enhancement therapy, to name a few. For reinforcement of abstinence, the best outcomes of CM are typically achieved if abstinence from a single drug is reinforced, if onsite urine testing monitoring is conducted at least twice weekly, and if reinforcement magnitude is high. The purpose of the prize CM system is to enhance patient outcomes while minimizing reinforcement and administrative costs (APA/Div12, 2016).

***Seeking Safety*** (strong research support for adults, modest research support for adolescents) – A present-focused, coping skills therapy to help people attain safety from trauma/PTSD and SUD, Seeking Safety (SS) embodies compassionate tone that honors what clients have survived and respects their strengths. It is a first-stage model that can be used at the start of treatment. There are five key principles of SS are: 1) Safety is the overarching goal; 2) Integrated treatment; 3) Focus on ideals (counteracts the loss of ideals in both substance use and trauma); 4) Four content areas: behavioral, cognitive, interpersonal, and case management; and 5) Attention to clinician processes.

There are 25 treatment topics, each with a clinician guide and client handouts. Designed to be flexible in use, the topics can be conducted in any order and number and pacing/length of sessions can be determined by the clinician. Among the topics are Safety, Asking for Help, Healthy Relationships, Red and Green Flags, Setting Boundaries in Relationships, and Taking Good Care of Yourself.

SS can be used with a broad range of vulnerable populations, including those who are severe and chronic, adolescents, military personnel/veterans, criminal justice, homeless, domestic violence, racially/ethnically diverse, mild traumatic brain injury or other cognitive impairment, serious and persistent mental illness, low-reading or illiterate clients, and others. It can further be conducted by a broad range of clinicians. SS was designed for flexible use and can be implemented at low cost (APA/Div12, 2016).

*Friends Care* (modest research support) – Friends Care (FC) is a six-month aftercare program that should be implemented in stand-alone community facilities. Persons exiting SU treatment programs are contacted up to one month prior to planned discharge to orient them to FC, introduce them to aftercare staff with whom they will be working, and jointly develop preliminary aftercare plans. Services are offered by counselors under the direction of a supervisory case manager, with emphasis placed upon building community supports to drug-free living. At least some of the following services are provided at a frequency specified in the aftercare plan: a) supportive counseling with review and strengthening of risk reduction behaviors/prosocial functioning; b) case management services including skills building for obtaining needed resources; c) work with client's significant other/relevant family; d) obtaining/maintaining employment through skills building in job finding/workplace demeanor; e) affiliation with supportive community organizations/groups; f) review of HIV prevention behaviors; and g) crisis intervention. Guidance is available in the detailed implementation manual.

*Guided Self-Change* (modest research support) – Guided Self-Change (GSC) Treatment for substance use disorders integrates motivational interviewing, relapse prevention techniques, and cognitive-behavioral to help individuals functionally analyze their alcohol or other drug problems and develop plans of their own for changing. It has been evaluated in English and Spanish, and can be delivered in individual or group formats. GSC is especially applicable for persons whose alcohol or drug problems are not severe. Materials can be downloaded and/or printed from the GSC Web site at [http://www.nova.edu/gsc/online\\_files.html](http://www.nova.edu/gsc/online_files.html). Among the available materials are therapist and client handouts, clinical tips and tools, client homework assignments, other clinical/motivational handouts and forms, and Timeline Followback (TLFB) forms (APA/Div12, 2016).

## For Alcohol Use

*Behavioral Couples Therapy for Alcohol Use Disorders* (strong research support) – Behavioral Couples Therapy for Alcohol use Disorders, also known as ABCT, is an outpatient treatment for people with AUDs and their intimate partners. It is based on four assumptions—1) intimate partner behaviors/couple interactions can be triggers for drinking; 2) intimate partners can reward abstinence; 3) positive intimate relationships are keys to motivation to change drinking behavior; and 4) reducing distress in relationships lessens risk for relapse. Using CBT, the therapist works with the person who is abusing alcohol and his/her partner to: identify and reduce the partner's behaviors that cue or reinforce the drinking; strengthen the partner's support of efforts of the person's efforts to change through reinforcement of positive change and use of sobriety contracts; increase positive

couple interactions through activities and assignments designed to increase positive feelings and improve constructive communication and problem-solving; and improve person's coping skills and relapse prevention techniques to achieve and maintain abstinence.

The treatment program consists of 2-3 hours of assessment for treatment planning, followed by 12-20 weekly therapy sessions for the person who is drinking along with his/her partner. Treatment follows cognitive-behavioral principles applied to couples therapy and specific therapeutic interventions for AUDs. A typical session follows this sequence:

- 1) Therapist asks about any drinking since the last session;
- 2) Couple presents and discusses homework assigned at the last session and use of a sobriety contract, if applicable;
- 3) Couple discusses any drinking or relational problems since the last session;
- 4) Therapist presents new material and couple engages in active learning activities in the session related to the new material;
- 5) Couple discusses upcoming high risk situations; and
- 6) Therapist assigns new homework.

Optimal implementation of ABCCT occurs in the context of an existing clinic or private practice with certified/licensed behavioral health professionals who have a background in treating AUDs and knowledge of CBT (APA/Div12, 2016).

***Moderate Drinking*** (very strong research support) - Moderate Drinking (MD) involves a Web application based on principles of behavioral self-control training. It is an interactive, individualized program that guides people to set goals, self-monitor their behavior, and get detailed feedback on their progress based on their input. However, there is an element of structure. MD modules address motivation, identifying and managing triggers, developing alternatives, problem solving, dealing with lapses and relapses, considering abstinence, and self-monitoring one's mood. The program recommends first choosing a goal (abstinence or moderation), building motivation for change, "doing a 30" (a self-imposed and flexible period of abstinence that can range from 1-30 days), setting drinking goals/limits, and then self-monitoring the drinking. Individuals are asked to enter their self-monitoring data when they log back onto the site, which the program then uses to generate detailed feedback about their progress. It is recommended that people go through the modules in sequence, but its flexibility allows the choosing of which modules might best meet their needs (APA/Div12, 2016).

***Prize-Based Contingency Management*** (modest research support) – See description under "Mixed Substances" above.

## For Cocaine Use

*Prize-Based Contingency Management* (modest research support) – See description under “Mixed Substances” above.

It should be noted that other psychological treatments may also be effective in treating cocaine dependence, but they have not been evaluated with the same scientific rigor as the treatment above.

## For Tobacco Use

*Smoking Cessation with Weight Gain Prevention* (modest research support) – The Smoking Cessation with Weight Gain Prevention program is a cognitive behavioral treatment that fosters tobacco cessation along with weight management. It was designed for smokers who express some reluctance to quit because of concern about gaining weight. Treatment focuses on smoking cessation first, followed by weight control. Using this sequential form of intervention has been found to produce a rate of smoking cessation comparable to treatment for tobacco alone, but with less weight gain. Both the cessation and weight management components incorporate cognitive behavioral elements and are typically provided in a group format. The weight management component also includes meal replacements and physical activity (APA/Div12, 2016).

As for cocaine dependence, other psychological treatments may also be effective in the treatment of tobacco use. Such treatments, however, have not been evaluated with the same scientific rigor as the treatment mentioned above.

## For Co-Occurring Disorders

There are six evidence-based practices (EBPs) described in the “Integrated Dual Disorders Treatment Implementation Resource Kit”, with *integrated dual disorders treatment* (IDDT) identified as the EBP for co-existing substance use and mental illness (SAMHSA, 2013). An intensive approach, the SAMHSA-endorsed IDDT model features 26 domains. Persons receiving IDDT have a multidisciplinary team comprised of a dual diagnosis clinician and at least two of the following: physician, nurse, case manager, providers of ancillary rehabilitation services such as supportive housing, vocational, etc. A substance use specialist with a minimum of two years of experience should work collaboratively with this team as well. Any interventions (including the ancillary rehabilitation services) must be consistent with and determined by the individual’s stage of treatment/recovery. Thus, it must be determined if the individual is in the engagement, persuasion, active treatment, or maintenance/relapse prevention stage of recovery.

Treatment should be provided for as long as necessary, with intensity modified according to need and degree of recovery. Interactions must be based on MI and include expressing empathy, developing discrepancy between goals/continued use, avoiding arguments, rolling with resistance, and supporting hope/self-efficacy. If the person is in the action or relapse prevention stage of recovery, substance use counseling should focus on:

- How to manage cues to use/consequences of use;

- Relapse prevention strategies;
- Alcohol and drug refusal skills;
- Problem-solving skills training;
- Challenging beliefs about substance use; and
- Social skills training and coping skills

Persons in those stages should further be connected to community self-help groups such as AA, NA, etc. While counseling can be provided in different forms and formats, individuals should be offered group treatment specifically designed to address the co-occurring substance use and mental health problems. Significant others should be involved, to the extent possible. Efforts should also be made to enhance the person's health, e.g., encouraging him/her to practice proper diet and exercise or find safe housing (Improving MI Practices.org, n.d.).



"This course was developed from the public domain document: Substance Use Best Practice Tool Guide, 2016 – Division of Clinical Leadership in Collaboration with the Division of Substance Use Services, TN Department of Mental Health & Substance Abuse Services."