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Abstinence-based treatment

CATEGORY: Treatment

ALSO KNOWN AS: Minnesota model of addiction treatment

DEFINITION: Abstinence-based treatment of drug and alcohol addiction is based on addiction as a disease. According to this treatment model, no cure exists for the disease of addiction. Through counseling and continued support, the addicted person can recover as long as he or she maintains lifelong abstinence from drugs and alcohol.

HISTORY

Abstinence-based treatment was first developed at Willmar State Hospital and Hazelden Treatment Center in Minnesota in 1949. The treatment was targeted at “hopeless” alcoholics and was based on the principles of Alcoholics Anonymous (AA). Borrowing from the twelve-step meetings of AA, developed in the 1930s, these alcoholic treatment centers added residential treatment that included lectures, open discussions, small group therapy, and peer interaction.

First known as the Willmar or Hazelden model, and then the Minnesota model in the 1970s, abstinence-based treatment centers became the predominant model for treating both alcohol and drug misuse in the 1980s. Private treatment in twenty-eight-day residential treatment centers dominated the treatment landscape but was affected by cost-cutting managed-care by the 1990s.

Most abstinence-based treatment now occurs in outpatient settings. Treatment focuses on individualized treatment plans, family involvement, and frequent use of group meetings such as AA, Narcotics Anonymous, and Al Anon. Studies show that more than 90 percent of drug and alcohol treatment programs in the United States are abstinence-based, and most use the twelve-step program of AA as a core principle.

BASIC PRINCIPLES

The first treatment principle is that all addiction, no matter the substance, is caused by lifelong physiological, social, and psychological disease processes. No cure exists for the disease of addiction, but recovery is possible through peer support and positive change. This principle removes the guilt that is associated with addiction and focuses on the disease instead of the addicted person. The addicted person begins by admitting that the disease makes him or her powerless over drugs and alcohol.

Recovery involves taking responsibility for the disease and making necessary changes in thinking and behavior. This type cognitive behavioral therapy may include individual and group therapy. Personal change may include recognizing denial and other self-defeating behaviors and replacing these negative thoughts with gratitude, honesty, forgiveness, and humility. For many addicts and alcoholics, key components of successful abstinence include a spiritual awakening, faith in a higher power, and faith in the power of being part of a recovery community. A final principle is that without continued abstinence, addiction is a progressive and ultimately fatal disease.

BASIC COMPONENTS

Diagnosis should begin with a comprehensive evaluation that recognizes that addiction is a social, biological, and psychological disease. The initial phase of treatment may require medically supervised detoxification. Comorbid diseases related to alcohol or drug misuse and dual diagnosis such as bipolar disorder, attention deficit/hyperactivity disorder, or depression should also be recognized and treated.

Treatment for primary addiction may include the use of control-craving drugs, individual cognitive behavioral therapy, group therapy, family therapy, and relapse prevention therapy. Abstinence-based treatment may be adapted to a long period of residential treatment or may occur through outpatient care.

Because this treatment considers addiction a lifelong disease, addicts are encouraged to attend after-care programs and twelve-step meetings, where they can benefit from the reinforcement of core principles and the support of other recovering people.

SUCCESS AND CRITICISM

Abstinence-based treatment is often criticized for having a low success rate, but because relapse is accepted as part of the natural course of the disease of addiction, it is difficult to give much credence to studies that look at one-year or even five-year success rates. Many addicted people fail initial treatment, have several relapses, and then continue with many years of sustained abstinence. According to the National Institute on Drug Abuse, relapse rates for addictions are similar to those for other chronic diseases, such as diabetes, hypertension, and asthma.

The abstinence-based treatment model also is criticized for being one-size-fits-all; for not allowing other treatment options, such as the harm-reduction model; for not being adaptable to persons who cannot accept the spiritual concept of a higher power; and for encouraging unattainable goals. These criticisms and alternatives are under discussion and study.

Still, most experts agree that abstinence should be the first and primary goal of addiction treatment. In the United States, therefore, abstinence-based treatment remains the treatment of choice for drug and alcohol addiction.

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Derived from: "Abstinence-based treatment." *Addictions & Substance Abuse*. Salem Press. 2012.

See also: Alcoholics Anonymous: The Twelve Steps; Hazelden Foundation; Minnesota model; Relapse

Addiction

CATEGORY: Health issues and physiology

DEFINITION: Addiction is a chronic brain disease and is identified as substance use disorder by the American Psychiatric Association in their most recent publication of the *Diagnostic and Statistical Manual of Mental Disorders* (2013), the *DSM-5*, which is compiled to describe and diagnose all currently identified mental health problems that may receive a formal medical diagnosis in the United States.

THE COSTS OF ADDICTION

According to the National Institute on Drug Abuse in April 2017, the societal cost of drug and alcohol addiction, in terms of lost productivity, crime, and health-care associated costs, is more than \$740 billion per year. Perhaps an even greater cost, but one that is far more difficult to calculate, is the harm of addiction to those addicted and the "collateral damage" that often occurs to the loved ones of the addicted individual.

Most people can think of someone in their lives—a friend, partner, parent, or child—who is affected by addiction. Addiction is far too common, and its effects can be devastating. Researchers are making considerable progress in understanding the illness, and with greater understanding should come better treatment and more reason for hope.



A drug addict injects a fellow user. (via Wikimedia Commons)

DIAGNOSTIC CATEGORIES RELATED TO ADDICTION

Substance use disorder involves a set of maladaptive set of behaviors associated with the taking of substances, including drugs and alcohol, that lead to significant impairment or distress. Maladaptive behaviors include the failure to fulfill one's responsibilities at work, school, or home; engaging in risky or dangerous situations while using substances (such as driving while intoxicated or operating machinery while under the influence of drugs); or continuing to use substances despite recurrent negative consequences (such as losing one's job or arguments or physical altercations with others).

Tolerance of a substance is also an diagnostic criteria of addiction and substance use disorder. Tolerance is the need for increased amounts of a substance to achieve the desired effect or to reach intoxication. Tolerance is also marked by noticeably diminished effects despite continued use of the same amount of the substance. Other criteria include withdrawal (unpleasant symptoms associated with drug removal). Additional criteria for substance dependence include the tendency to escalate drug use; taking the drug more frequently, in greater doses, or for longer periods of time; loss of control over drug use; and an inability to limit one's use.

The term "addiction" has been expanded in the DSM-5 to include excessive, compulsive, or destructive habits that have nothing to do with drugs or alcohol, such as gambling disorder. Although several societal

addictions have not been formally recognized in the DSM-5, two terms, *workaholics* and *shopaholics* are commonly used by individuals to reflect society's belief that a person can be addicted to working or to shopping. The concept of addiction also is commonly applied to cigarette smoking, Internet use, overeating, and sexual behavior, though not formally recognized in the DSM-5.

GENERAL FEATURES OF ADDICTION

Addictions occur with behavioral rewards. Behavioral rewards include experiences that a person wants, experiences for which a person is willing to behave in a particular way. In short, the objects of addictions always feel good, at least in the beginning. While certain potentially addicting drugs and behaviors may indeed

be harmful in all circumstances, this is not true across the board. There is nothing inherently unhealthy in things that feel good, or in the tendency to engage in certain behaviors to obtain those things. These behaviors have evolved, and they are tendencies that have served well for human survival.

The problem with addiction is that the effect of the behavioral reward changes in particular ways. With time and repeated exposure, a person's reaction to the behavioral reward changes in three observable ways. First, the person may develop a tolerance and then experience withdrawal. More and more of the behavioral reward will be needed to get the same amount of pleasure (tolerance), and the behavior may need to continue to keep feeling pleasure (withdrawal).

The presence of tolerance and withdrawal has been used as the primary indicator of addiction in years past. However, a person can vary in the extent to which he or she experiences tolerance and, especially, withdrawal, in his or her addiction, even with drugs such as alcohol, which produce symptoms of physical dependence.

In addition, other changes in a person's reaction to behavioral rewards also typically accompany the development of addictions. For example, the value of the addictive behavior, relative to other possible behaviors, changes. The person's behavioral repertoire shifts from one in which variable behaviors and responses occur to a far narrower focus, in which

behaviors associated with the addiction come to predominate. Finally, the person seems to lose control of the addiction. Once he or she gets started with the behavior in question, they “overdo it” in ways that they did not intend and that they frequently regret. Efforts to permanently curtail or eliminate the addiction are extraordinarily difficult. Relapse, or returning to the behavior after successfully staying away from it for a time, is a common problem.

MODELS OF ADDICTION

Many different models, from widely diverse theoretical orientations within the field of psychology and medicine, have been proposed to account for addiction. Advances in brain imaging, however, have allowed scientists and researcher to see inside the brain of addicted individuals and study the areas of the brain that are affected by drugs and alcohol. Research has found that addiction is a brain disease because alcohol and drugs change the structure and function of the brain itself. Although many outside the scientific and research communities still consider addiction to be learned behavior, research is proving otherwise.

Other experts have sought to explain addiction in terms of personality variables, emphasizing the role of inner conflict or inadequate psychological coping mechanisms. Finally, numerous biological models search for the root of addictive behaviors in genetics and neurochemistry. It seems likely that a complete understanding of addiction may ultimately require a synthesis of several, if not all, of these approaches.

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See also: Models of addiction; Psychological dependence; Risk factors for addiction; Science of addiction; Substance misuse

Addiction medications

CATEGORY: Treatment

DEFINITION: Addiction medications are drugs used to treat substance use disorders. The drugs are best used when combined with psychosocial treatment.

INTRODUCTION

Addiction is a brain disease. Once a person becomes addicted, changes typically occur in the body and the brain that make these systems function differently than before the development of the addiction. The functional (and perhaps structural) changes to the brain that occur with addiction can sometimes be treated with medications that allow the brain to function normally in the absence of the drug.

Medications are available for the treatment of opiate, alcohol, and cocaine use disorders and for nicotine use. Each of these medications will be considered individually here. No medication exists for the treatment of methamphetamine addiction, but about one-half dozen are being studied.

Many of the medications used in the treatment of addiction are used “off-label.” In other words, the medications are used for addiction even though they have been approved by US Food and Drug Administration (FDA) to treat other disorders, such as depression, muscle spasms, insomnia, and nausea. Only those medications currently legal to use in the United States (including those used off-label) are presented here. When available, both the clinical name and the more commonly used name will be included. The common name will appear in parentheses.

Many of the medications discussed fall under one of three categories: antagonist, full agonist, or partial agonist. An antagonist is a substance that binds to receptor cells so tightly that it will block any other substance from binding to that cell. Antagonists also bind to the cell without stimulating the cell or otherwise causing a response. Examples of antagonists include naltrexone and ondansetron.

A full agonist is similar to an antagonist in that it completely binds to a receptor cell. Unlike antagonists, however, full agonists will activate that receptor site. Examples of full agonists include morphine and topiramate (a gamma-aminobutyric acid, or GABA, agonist).

Partial agonists, like agonists, bind to receptor cells and activate them, but they cannot bind fully, so the receptor is only partially activated. Examples of partial agonists include varenicline and buprenorphine.

Medications are wonderful tools in the treatment of both physical and mental illnesses and disorders. It should be noted, however, that patients receiving medication also should receive psychosocial treatment.

MEDICATIONS FOR ALCOHOL ADDICTION

Alcohol is a central nervous system depressant. It works by interfering with communication between nerve cells and by interacting with the receptors on some cells. Alcohol suppresses excitatory nerve pathway activity (for example, glutamine) and increases inhibitory nerve pathway activity (for example, GABA). Thus, alcohol lowers inhibitions, which is why it is often found to be a significant factor in violent and sexually motivated crimes. Medications used (or under study) to treat alcohol use disorders include baclofen, campral (Acamprosate), disulfiram (Antabuse), naltrexone (ReVia or Vivitrol), ondansetron (Zofran), and topiramate (Topamax).

Baclofen. Baclofen treats muscle tightness and cramping or spasms that are often associated with spinal cord injury, spinal cord disease, or multiple sclerosis. The drug is a derivative of GABA and works with alcohol dependence by decreasing withdrawal symptoms and cravings. These effects are achieved by inhibiting the activation of the receptors in the brain that become stimulated during withdrawal.

Campral. The FDA approved campral for the treatment of alcohol use disorder in 2004. Before this time, campral was used widely across Europe in the treatment of alcohol use disorders. Campral works by stimulating GABA receptors and thereby reducing the negative symptoms a person may experience when attempting to abstain from alcohol.

Disulfiram. Disulfiram has been used to treat alcohol use disorders since the 1950s. Originally thought to work well as a treatment for parasites, experts began to notice that persons who took the medication and who also drank alcohol became ill. The medication disrupts the metabolism of alcohol, resulting in a hangover type of physical illness. The physical effects caused by disulfiram in persons also ingesting alcohol include headache, flushing, nausea, dizziness, and vomiting.

Naltrexone. Naltrexone is an antagonist; it binds to the mu (μ) opioid receptors in the brain, but it does not stimulate them. This is important because naltrexone is used to treat addictions but does so without causing euphoria, like some addiction medications. Naltrexone is available in two different administrations: oral and injection.

The oral version of naltrexone, ReVia, was approved for the treatment of alcohol use disorders in 1995. However, because it must be taken daily, its effectiveness varies for those who are not medication compliant or not committed to treatment. In addition, side effects may be substantial because the medication levels vary throughout the day. The injection form of naltrexone, Vivitrol, was approved in 2006. Vivitrol is a long acting, once-a-month, injection that works the same way as ReVia, but it has fewer side effects and better medication compliance.

Ondansetron. Ondansetron is an antiemetic that reduces the nausea and vomiting that often accompany chemotherapy treatment. Ondansetron is a serotonin receptor antagonist and works by reducing the activity of the vagus nerve, thereby blocking the sensation

of the need to vomit. This medication also has been studied as a treatment for other disorders, including alcohol use disorder, and although it is not approved for this, it can be prescribed off-label.

Topiramate. Topiramate treats epilepsy; however, research also indicates that it may be useful as a treatment for alcohol, cocaine, and nicotine dependence. Topiramate is a glutamate antagonist and a GABA agonist. It works by blocking the glutamate receptors and by increasing the effects of GABA, which help to calm over-excited nerve cells. Topiramate has been shown useful in the treatment of alcohol dependence. Topiramate has a number of side effects, including weight loss, impaired memory and concentration, numbness and tingling of extremities (although this side effect is transient), and the development of kidney stones.

MEDICATIONS FOR COCAINE ADDICTION

Cocaine is a stimulant of the central nervous system derived from the coca plant (not to be confused with the cocoa plant, which is used for chocolate). Cocaine is a serotonin-norepinephrine-dopamine reuptake inhibitor, which means that cocaine can increase alertness, euphoria, energy, motor activity, and feelings of competence. However, it also can result in anxiety, paranoia, restlessness, delusions, hallucinations, and tachycardia. Medications used (or under study) to treat cocaine use disorders include baclofen, disulfiram, gabapentin (Gabitrol), and modafinil (Provigil), and the dietary supplement N-acetylcysteine (NAC).

Baclofen. Baclofen, which is used to treat muscle spasticity (found in persons with multiple sclerosis), also has been studied as a potential treatment for cocaine addiction. Baclofen is said to work by decreasing the effects of dopamine in the brain and, thereby, reducing cocaine-induced euphoria.

Disulfiram. Disulfiram, which is used to treat alcohol use disorders, also has been studied as a treatment for cocaine disorders. In one study conducted at Yale University, disulfiram was found to work well in decreasing cocaine use. Similar to its effect with alcohol users, the study showed that is caused cocaine users to become physically ill. This research has since been replicated.

Gabapentin. Gabapentin is an anticonvulsant medication used to treat seizure disorders, depression, and pain. The medication also has been studied as a treatment for cocaine use disorders. The medication works

by making cravings less intense and by lessening the severity of any relapse to cocaine use. Because of these positive effects, however, some doctors are hesitant to prescribe gabapentin for cocaine use disorders; it is believed that the medication will reinforce cocaine use rather than discourage it.

Modafinil. Modafinil is FDA approved for the treatment of narcolepsy and other sleep disorders. It also has been studied in the treatment of cocaine use disorders. However, findings have proven inconclusive.

N-acetylcysteine. N-acetylcysteine is an over-the-counter herbal supplement with purported antioxidant effects. It has been used to treat everything from carbon monoxide poisoning to acetaminophen overdose. Its effectiveness in treating cocaine use disorders has not been determined.

MEDICATIONS FOR METHAMPHETAMINE ADDICTION

Methamphetamine is a synthetic drug. Although chemically similar to amphetamine, its effects are much longer lasting. Methamphetamine is a central nervous system stimulant with euphoric effects similar to those found with cocaine. Methamphetamine works by increasing the release of dopamine in the brain. No approved medications are on the market to treat methamphetamine addiction, and no medication is used off-label to treat methamphetamine addiction. However, a few drugs are under study, including paroxetine (Paxil), ondansetron, and gabapentin.

Paroxetine. Paroxetine is indicated for the treatment of mood disorders (depression and anxiety) and obsessive-compulsive disorder and panic disorder. It also is under study for the treatment of methamphetamine misuse.

Ondansetron. Ondansetron, used to treat alcohol use disorders, is FDA approved as an anti-nausea drug that may work to block specific binding sites for the neurotransmitter serotonin. Some preliminary studies have indicated that ondansetron may block the effects of methamphetamine.

Gabapentin. Gabapentin, in addition to being a potential medication for the treatment of cocaine use disorders, also may be a viable option for the treatment of methamphetamine use disorders.

MEDICATIONS FOR NICOTINE ADDICTION

Nicotine is a stimulant found in tobacco and tobacco products. The American Heart Association reports that nicotine dependence is one of the most difficult

addictions to break. Some medications, including bupropion (Wellbutrin) and varenicline (Chantix), and other products, such as nicotine replacements, are available to assist persons addicted to nicotine. The use of bupropion and varenicline in nicotine addiction treatment, however, has been linked to serious side effects, including depression and suicidal ideation. Nicotine replacement products (such as patches and gum) provide the user with nicotine, but they do not have the harmful carcinogens that accompany many of the delivery systems (such as smoking or tobacco chewing).

Bupropion. Bupropion is a well-known antidepressant that has been used in the treatment of nicotine dependence. The drug works by reducing the urge to smoke.

Varenicline. Varenicline is a nicotine receptor partial agonist. It works by decreasing the cravings for nicotine and by decreasing the pleasurable effects of nicotine consumption.

MEDICATIONS FOR OPIATE ADDICTION

Opiates are narcotic analgesics (painkillers) that are derived from the poppy plant and from several artificial means. Opiates work by binding to specific receptors in the brain. Because the human body creates its own form of opiate, the brain has specific receptors created just for this substance. The receptors where opiates bind typically control movement, digestion, mood, the experience of pain, and, most problematic, body temperature and respiration.

Opiate use disorders vary and can include addiction to heroin and painkillers (such as vicodin and oxycodone). Medications used to treat opiate use disorders include buprenorphine, methadone, and naltrexone.

The FDA approved buprenorphine in 2002 as a treatment for opiate use disorders. The drug works by binding to the same receptors as opiates, but because it is a partial agonist it does not completely fill the receptor; therefore, little euphoria is achieved when taken as prescribed. A doctor prescribes buprenorphine, and induction (introduction of buprenorphine into the system) can be done in a doctor's office rather than at a substance misuse treatment facility. The effects of buprenorphine can last up to three days, so unlike the common drug methadone, daily doses are not required.

There are two different formulations of buprenorphine: Subutex and Suboxone. Subutex contains only buprenorphine and is the formulation used during the first few days of induction. Suboxone includes both buprenorphine and naloxone. Naloxone is a powerful substance that blocks the effects of opiates and is often used to treat opiate overdose. When combined with buprenorphine, it greatly reduces the misuse potential of this medication.

Methadone. Methadone, perhaps the best-known medication to treat opiate use disorders, is a synthetic opiate and a narcotic pain reliever similar to morphine. It has been used in the treatment of opiate addiction since the 1960s. Methadone is a full mu (μ) opioid agonist and works by binding to this receptor and by preventing other opiates from binding to that same receptor. However, methadone, if given in the incorrect dosage or through certain routes, can result in euphoria similar to that of illicit opiates.

Withdrawal from methadone can take several weeks to several months and has been described as more difficult to withdraw from than other opiates. Methadone is taken orally and is typically taken daily.

Naltrexone. Naltrexone, in addition to treating alcohol use disorders, also has been shown to be effective in the treatment of opiate use disorders. When used for opiate use disorders, naltrexone works as it does for alcohol: It binds tightly to the mu (μ) opioid receptors and prevents any other drug from binding to those same receptors. The binding action reduces cravings for the substance and also prevents the high that is normally experienced from opiate use. Because naltrexone is an antagonist, it is powerful enough to push the opiates out of the receptors to bind to them. This is important because naltrexone will place a patient into precipitated withdrawal from opiates if the patient has not abstained from opiates before receiving naltrexone.

There are two ways to administer naltrexone: orally (ReVia) and through an intramuscular injection (Vivitrol). Both forms are FDA approved for the treatment of opiate use disorders.

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See also: Baclofen; Bupropion; Methadone; Naltrexone

Addictive personality

CATEGORY: Psychological issues and behaviors

DEFINITION: Addiction is a chronic, relapsing medical condition. Researchers have been unable to provide evidence of the addictive personality type. It was thought that there is a character flaw that leads inevitably to addiction. Another theory is that people develop addictions because they are

risk-takers or impulsive, and are out of control of their lives. Recent research into addiction and personality focuses on the behaviors seen more frequently in persons with addictions. There is evidence that addiction can develop in a person with any type of personality. Addictions do not just include alcohol and opioid drugs. There can be addictions related to such things as: computer gaming, cell phones, eating, smoking, sex, exercise, gambling, and shopping.

PREVALENCE

Researchers studying addictions have found that roughly 47% of people in the U.S. may be addicted within a 12 month period.

CAUSES

About 50% of people have a genetic predisposition for developing addictions. The genes are inherited from a family member. Persons with one of these genes often have family members with addictions. Most of the genes causing the predisposition for addiction have been identified with research using rodents.

Recent research suggests that it is common that people become addicted due to stressful life events and difficulty coping with them. Originally, addiction was thought to be a disease of adolescents. Now it has been diagnosed in people of all ages and stages of their lives. An example is seen in midlife persons who suddenly lose their jobs, and are unable to find another comparable job. Other possible life events are: death of a child or other family members; divorce; the onset of a chronic, life-threatening disease; and financial problems. One researcher feels that loneliness and lack of human contact is actually the cause of addictions. If addiction is caused by stressful life events, it is more common in a person unable to self-regulate their feelings.

RISK FACTORS

There are a number of factors that are thought to increase a person's risk for developing an addiction. One risk factor is the presence of other mental health problems, such as anxiety, depression, schizophrenia and Post Traumatic Stress Disorder (PTSD). Others at risk for addiction are persons who have an anti-social personality, apathy, or loneliness. Another researcher thinks that people who struggle with addiction may be risk-takers and adventurous. More unusual problems

that may lead to addiction are low levels of dopamine, desire for self-harm, and difficulty regulating one's behaviors or thoughts.

ASSESSMENT

Some behaviors are more common in persons with an addiction. These behaviors are thought to be related to the disease of addiction. They are impulsive behavior, negative feelings about values that society values, trouble dealing with stress, denial of the seriousness of an addiction, the need for instant gratification, erratic moods, and unwilling to ask others for help with their problems. These behaviors are often one of the signs that a person has developed an addiction.

DIAGNOSIS

The compulsions and lack of control that characterize addiction are signs that the brain's neurophysiology is changing. Neuro-imaging techniques are able to identify the parts of the brain that have been affected. There are two tests that can diagnose an addiction. They are functional magnetic resonance imaging (fMRI) and positron emission tomography (PET) scan. Both of these tests assess the activity of specific areas of brain tissue and brain anatomy. The fMRI maps blood flow and oxygenation of the brain. This increase in blood flow represents an increase in the brain metabolism. These areas are the areas of brain pathology. The PET scan measures areas of increased metabolism by analyzing the locations of increased glucose. The glucose is marked by an irradiated tracer. The results of both tests highlight the areas of the brain that are active with addiction.

With addiction, the prefrontal cerebral cortex uses glutamine to interact with dopamine. This combination initiates cravings and visualizations. The next area of the brain is the orbitofrontal cortex where other pleasurable hormones are released. They start to affect decision making and regulation of emotional behavior. The prefrontal cortical regions govern the reward-related behavior that is impaired in addicted persons. The orbitofrontal cortex can stop the progression on the pathway if it feels that too much drug has been used. The orbitofrontal cortex can initiate a decision to reject immediate gratification in favor of greater delayed rewards.

Involvement of the neurotransmitter dopamine is further evidence of neural participation in addictive

processes. Dopamine is believed to act on mechanisms of expectation and reward. Most addictive drugs increase dopamine levels and dopaminergic transmission. Appetizing food and addictive drugs have a comparable effect in raising levels of dopamine. The other areas of the brain that are affected by addiction include: the nucleus accumbens (NAC), the ventral palladium, the habenula, the insula, the anterior cingulate, and the amygdala. The parts of the brain involved with the production of dopamine, are the source of the "high" that causes craving for a drug. The NAC is a source of dopamine which rewards pleasant behavior in the non-addicted person, and rewards the addicted person with high levels of dopamine.. The NAC also helps a person to decide whether they wish to get involved with drug taking. The ventral palladium is another area of the brain that is involved with the reward for the addicted person. The habenula seems to initiate negative feelings, and to stimulate the insula.

The insula gives a person another chance to decide whether they wish to take an addicting drug, and it processes a person's feelings, like disgust, hunger or thirst. The anterior cingulate works with the insula to help a person to reconsider their decisions as they make them. The insula is involved in the person's judgments and conflicting feelings to assist in making a decision related to drug-taking. The anterior cingulate analyzes their plans and whether they are good or bad. The insula attempts to change the plans until they are right for the person. The amygdala helps a person to identify their feelings about their drug taking plan. If the plan is not a good one it may cause feelings of fear.

TREATMENTS

There are several ways of treating addiction problems. They are counseling, and medications. For the treatment to be successful, the person must be motivated to make the change. Recovery involves counseling, or meetings like Alcoholic Anonymous (AA) or the 12 step programs. A counselor teaches Cognitive Behavioral Therapy (CBT), which is a way to deal with the tough occurrences in life, and to self-soothe. AA has group meetings where each person shares their story. A member who has been successful in giving up their addiction becomes an advisor to a new member. The new member can telephone the advisor whenever

they feel like going back to their addiction. The 12 step programs are group meetings.

The drugs used to treat alcoholism are Antabuse, Campral, and Naltrexone. The person has to agree to take Antabuse because it causes uncomfortable symptoms if you drink alcohol. The symptoms are nausea, flushing and irregular heartbeat. Both Campral and Naltrexone decrease the symptoms of withdrawal from alcohol. For drug addiction, the drugs include Naloxone (Narcan), methadone, suboxone (buprenorphine), and Naltrexone. Naloxone is used in an overdose to reverse the symptoms of the drugs. Naloxone is life-saving if administered soon after the overdose. Naltrexone, methadone, and suboxone reduce the symptoms of withdrawal from drugs. Methadone must be obtained from a methadone clinic, and the person is given a few pills.

FUTURE/OUTCOMES

There are no easy solutions for addictions, especially addiction of alcohol and drugs. It would be easier if drugs and alcohol were less available. Cocaine, Heroin, amphetamines, and Fentanyl are readily available on the street. Alcohol is even more available than drugs, and drinking alcohol is socially acceptable. We have limited numbers of psychiatrists and drug treatment programs. There is a federal parity law that requires the same payments to psychiatrists and drug treatment centers, as medical care. Despite the parity law, most health insurance does not pay for addiction treatment at a treatment center. The only hope is to more aggressively educate both children and adults about the dangers of drug and alcohol addiction.

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FOR FURTHER INFORMATION

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Szalavitz, Maia. *The Unbroken Brain: A Revolutionary New Way of Understanding Addiction*: St. Martin's Press, April 5, 2016. Szalavitz writes about her own addiction as a child, and how she believes that addiction is a learning disorder.

Szalavitz, Maia. (5 April, 2016) "The Addictive Personality Isn't What You Think It Is." Retrieved July 12, 2018, from <https://ScientificAmerican.com/article/The-Addictive-Personality-isn-t-what-You-think-it-is/> The author writes about her own experience with addiction and her feeling that tolerance, prevention and treatment should be used for addicts.

See also: Addiction; Behavioral addictions: Overview; Impulse control disorders; Risk factors for addiction; Science of addiction

Adolescents and alcohol misuse

CATEGORY: Social issues

DEFINITION: Alcohol misuse is a pattern of heavy drinking that significantly compromises a person's physical health and social functioning. According to the US National Institute on Alcohol Abuse and Alcoholism (NIAAA), an estimated 855,000 American adolescents aged twelve to seventeen years qualified for a diagnosis of alcohol use disorder (AUD) in 2012, accounting for 3.6 percent of American teenaged girls and 3.2 percent of American teenaged boys. Despite intensive government efforts to curb the problem, the prevalence of underage alcohol misuse has remained constant since about 1990.

SCOPE OF THE PROBLEM

Alcohol use and misuse among young people in the United States is pervasive and destructive. In the United States, adolescents misuse alcohol more than any illicit drug, and it causes the most harm. Despite a nationwide minimum legal drinking age of twenty-one years, the Substance Abuse and Mental Health Services Administration (SAMHSA) reports that 61 percent of high school students have consumed alcohol by the end of high school, 23 percent have consumed alcohol by 8th grade, 46 percent of 12th