Understanding Addiction

Addiction is the continued use of alcohol and other drugs even when that use is causing harm. Addiction is a disease of mind, body and spirit. It is a physical and psychological craving or compulsion to use a mood-altering substance.

The disease concept of addiction means that addiction is a primary disease—it's not the result of some other problem. For example, a bad marriage or boss or teacher didn't cause the problem.

Addiction is also progressive (if it continues, it will get worse), chronic (there is no cure for it, but it can be managed) and can be fatal (if it continues unchecked, it will cause death).

What are the symptoms of addiction?

Addiction leads to consequences in some or all of these areas of life: social, emotional, financial, legal, health, employment, family and school. Problems in these areas can be symptoms of the disease of addiction. Other major warning signs include craving for the substance, increase in tolerance, preoccupation with the substance, loss of control, blackouts and all forms of denial—blame, excuses, rationalization and minimization.

Why do people become addicted?

Research has shown that addiction is not a matter of an individual's strength, moral character or willpower. Instead it can be attributed to the way an individual's brain is "wired." Powerful, naturally occurring chemicals called neurotransmitters control our brain's activities, carrying messages between neurons. When people use alcohol and/or other drugs, the bloodstream quickly carries these intoxicating chemicals to the brain. In the brain, complex chemical reactions ensue that can distort reality. This causes a feeling of intoxication or "high." Some people find this feeling pleasurable and worth repeating—those people often become addicted. Other people find getting high an unpleasant experience and, as a result, seldom use alcohol and other drugs.

Why can't some people stop using alcohol and other drugs?

Most people suffering from the disease of addiction can't stop using, even when they are faced with losing everything: their job, their family, even their life. The mind and body react addictively to alcohol and other drugs, and they simply cannot control that fact. They are powerless against these substances.

Here's a great example. As soon as an addict heads for a bar, the brain begins making dopamine. The person has already begun the process of relapse before even touching the alcohol. The person's body and brain chemistry are such that the mere thought of alcohol or other drugs starts the dopamine snowball effect that could lead to not just one drink, but five, 10 or 20. The brain doesn't know the difference between imagining taking a drink and actually taking one. It reacts the same way—it wants more.

This is why Step One in a Twelve Step program is so important: "We admitted we were powerless over alcohol— that our lives had become unmanageable."

Remember:

- Addicted people didn't cause the disease. Their brain chemistry is such that they can't use alcohol and other drugs as other people do. Their addicted brains can't quit once they start using.
- Addicted people can't control or cure the disease, but they can manage it by working the Twelve Steps, taking advantage of recovery support systems and developing healthy spirituality.

It's not easy to accept the idea of powerlessness. But it's the first step to recovery. Once your loved one accepts the disease, he or she can then get down to the work of recovery.

How can you help your loved one maintain an ongoing recovery?

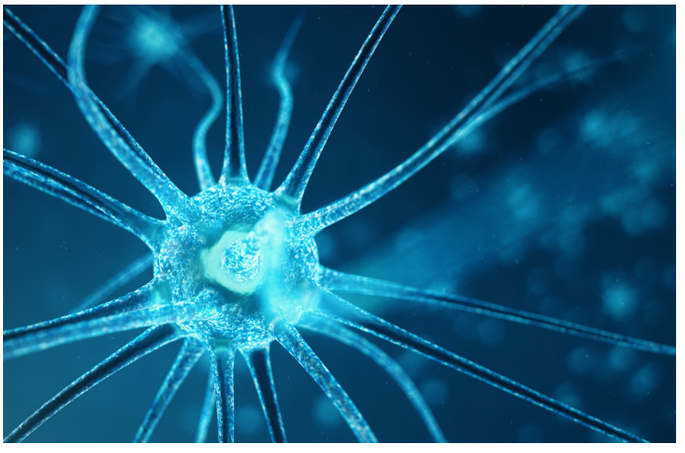
After working hard in early recovery, now it's time for your loved one to protect and plan for an ongoing recovery. Ultimately it's up to each of us to work our own recovery. But you can offer support by helping your loved one remember to work the Twelve Steps, utilize a sponsor and sober friends for support, and go to Twelve Step meetings. These practices have been proven to help recovering people develop and maintain a healthy, happy outlook and enjoy the freedom and peace of sobriety.

Drug Abuse, Dopamine and the Brain's Reward System

Why do people continue to use alcohol and other drugs chronically even after experiencing serious medical, social, legal or financial consequences? This is a question that has interested professionals in a wide variety of addiction-related fields for many years. Advances in neuroscience and biology have allowed scientists to better understand the physical roots of substance use and dependence, which has led to the contemporary disease model of addiction. By studying and understanding the biological characteristics of substance dependence, scientists and physicians are able to develop medical and pharmacological treatments that can significantly improve recovery outcomes.

Basics of Brain Function and Neurotransmitters

In order to carry out all of its necessary functions, from making sure your lungs are breathing to working out a calculus algorithm, the brain uses a complex communication system made up of tree-like cells called neurons. Neurons send electrical signals through your brain and the rest of your nervous system in order to manage everything that happens in the body.These electrical signals are controlled by chemicals called neurotransmitters, which are secreted from within the neurons and sent out in the brain to other surrounding neurons in order to activate (or deactivate) them. Neurons absorb these neurotransmitters through receptors.



Each neurotransmitter is like a key, and it fits into its own specific receptor, which acts like a lock. In order to maintain balance, the brain is able to change these receptor "locks" to fit other neurotransmitters when there is too much, or not enough, of a certain neurotransmitter in the system. While there are many different kinds of neurotransmitters, each neuron is only designed to produce one or two specific types. Generally, neurons are grouped together based on the neurotransmitters they produce and receive, which is why specific areas of the brain regulate certain functions.[1]

The Brain Following Initial and Early Substance Use

The early draw of drug use for most people is the pleasurable feeling they get while "high,"[2] a feeling that results from electric stimulation of specific areas of the brain that make up what is collectively called the brain's "reward center": the ventral tegmental area (VTA), nucleus accumbens (NAc), and substantia nigra (SN), all of which are located near the front of the brain.[3,4] The neurotransmitter that "unlocks" the electrical stimulation of these areas is dopamine—a neurotransmitter that is strongly associated with feelings of pleasure and reward.[4]

The biological purpose for this mechanism is to encourage life-sustaining behaviors (such as eating when hungry) by producing a pleasurable sensation

when the necessary behavior happens. Alcohol and other mood-altering drugs, however, artificially create this effect and do so more efficiently and intensely than natural rewards.[5,6] Research has shown that the drugs most commonly abused by humans (including opiates, alcohol, nicotine, amphetamines and cocaine) create a neurochemical reaction that significantly increases the amount of dopamine that is released by neurons in the brain's reward center.[7] The result of this dopamine overflow is the feeling of being high.

The Brain Following Chronic and Long-Term Substance Abuse

While the intense feelings of pleasure and reward derived from early drug use can play a substantial part in continued use of the drug, it is only a small part of the neurophysiological cycle of addiction. Learning has long been understood to be tied to the administration of rewards and punishments, and the intense reward sensation of drug intoxication creates a strong and rapid learning response in the brain, associating drug use with feelings of pleasure.[5] This association leads to higher and more frequent drug administration in order to experience the pleasure of the reward response more often.[5]

Additionally, the intensified dopamine response in the brain that mood-altering drugs produce does not naturally stop once the behavior is initiated or completed (as is the case with natural reward behaviors such as eating or having sex); as a result, cravings for the rewards associated with the drug continue to occur, even during drug use, which leads to compulsive, repetitive use.[5] Continued, long-term use also results in the brain reducing the number of dopamine receptors in the brain to adjust for the increased dopamine in the system.[8]

This reduction in dopamine receptors has a two-fold impact on addiction. First, reduced dopamine receptors in the SN are associated with impulsive behavior that has been tied in lab studies to escalating and compulsive self-administration of drugs.[4] Reduced dopamine receptors also result in a state known as "anhedonia," or a loss of pleasure in activities that were once enjoyed. The depressive feelings of anhedonia can drive a user to administer drugs in a reactive attempt to feel pleasure again, especially in a state of low self-control.[9,10] Self-control is further reduced as the toxic effects of long-term drug use begin to erode grey matter in the prefrontal cortex, reducing users' ability to rationally consider consequences as a result of reduced executive function and also reducing the prefrontal cortex's role in regulating the brain's reward system.[11]

Hazelden Betty Ford Patient Care Network Member

Avera Health is a collaborating member of the Hazelden Betty Ford Patient Care Network. Visit Avera.org/addictioncare to learn more. Call our Sioux Falls location at 605-322-4079 or Aberdeen at 605-622-5800.

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The Hazelden Betty Ford Foundation, a national nonprofit organization founded in 1949, is a force of healing and hope for individuals, families and communities affected by addiction to alcohol and other drugs.

Avera's mission is to make a positive impact in the lives and health of persons and communities by providing quality services guided by Christian values. If you think you may have problems paying part of your bill, contact your local business office or billing staff. We can discuss payment options that may be available to you.

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