

In The Mix With AOD

“In The Mix” With AOD Episode Five- The Science of Addiction

In today's society, there has been a revolution in providing proper resources for understanding addiction and how to approach recovery. However, it was not always like this in the scientific community. The study of addictive behaviors began by scientists in the 1930's, and they viewed people with addictions as “morally flawed” and lacking in willpower. Because of these perspectives, society responded to drug use by treating it as a moral failing rather than the health problem it truly is. With scientific advances, our views and responses to addiction and the broader spectrum of substance use disorders have changed drastically. Scientists have made discoveries on the brain that have revolutionized our understanding of compulsive drug use, and empowered us to respond more effectively to the problem. Now, it's understood that addiction is a medical disorder that changes the brain and changes behavior. Many biological and environmental risk factors have been identified and the search has begun for the genetic variations that contribute to the development and progression of substance use disorders. Despite these advances, it's important to recognize that we still don't fully understand why some people develop an addiction or exactly how drugs change the brain to foster compulsive drug use. Here in today's episode we'll be diving deeper into the science of addiction, discussing what an addiction is, what influences these substances have on our brains, why some people develop addictions and others don't, and resources there are available to help with addiction recovery through Grand Valley's Alcohol and Other Drugs Services.

Hey, I'm Bethann Long and welcome to this week's episode of “In The Mix” with AOD, a podcast provided through Grand Valley's Alcohol and Other Drug Services. The semester is flying by at such a rapid pace, I can't believe it. Before we know it, Thanksgiving will be right around the corner. I hope you all are hanging in there and making sure to take care of yourself physically and mentally as well! Today, we're going to be discussing the science behind addiction, a topic that is still misunderstood by many.

First, let's discuss what exactly an addiction is defined to be. According to the National Institute on Drug Abuse, addiction is defined as a chronic, relapsing disorder characterized by compulsive drug seeking and use despite the adverse consequences. This is considered to be a brain disorder because of its involvement of functional changes to brain circuits involved in reward, stress, and self-control. These changes can last a long time even after a person stops using substances. To help put the concept of addiction into perspective, it can be compared to many other diseases. For example, its symptoms can be compared to heart disease- both disrupt the normal, healthy functioning of an organ in the body, both have serious harmful effects, and both are, in many cases, preventable and treatable. However, if they're left untreated they can last a lifetime and may lead to death. Regarding the topic of addiction, it's important to be reminded that this is a treatable medical illness. Once a person develops a chemical dependence on a substance, it's not a character flaw and certainly doesn't speak on the character of those suffering through it. Treatment for addiction is highly effective, and we will go into detail on treatment resources available later on in this episode.

Now, the use of substances actually has a huge impact on our bodies, bigger than I believe many of us actually know. For some background knowledge on our brains, the human brain is wired to reward us when we do something pleasurable such as eating or exercising or other behaviors linked to our survival trigger that releases dopamine. Because of this, we can be encouraged to keep doing these

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activities and teach our brain to repeat the behavior. Substances trigger the same part of the brain and release an excessively large amount of dopamine, much more than normal. This process tells the brain that this is a behavior that should be remembered and repeated on a regular basis. However, not everyone who uses substances becomes addicted by this process, but if you're already at risk this is where the cycle of addiction can begin. According to the National Institute on Drug Abuse, "large surges of dopamine teaches the brain to seek drugs at the expense of other healthier goals and activities,".

The brain begins to adjust itself after becoming addicted to these substances, making them more addictive and rewarding than more natural rewards, like food. The brain of someone misusing these substances adjusts by producing fewer neurotransmitters in the reward circuit, or by reducing the number of receptors that can receive signals. Ultimately, the person's ability to experience pleasure from naturally rewarding activities is also reduced. This is the reason why a person who develops an addiction to substances eventually feels no motivation, lifeless, and or depressed, and is unable to enjoy the things that they found pleasure in doing originally. Now they feel an intense need to continue to taking these substances to experience even a normal level of reward- only making the problems worse. A larger amount of the substance will need to be taken to produce a familiar sensation which is an effect known as tolerance. There aren't only changes that occur in our brains as a result of these substances, but behavior changes are imminent as well. Scientists have looked at brain images from people with substance use disorders that show changes in areas of the brain that are critical to judgment, decision making, learning and memory, and behavior control. Cravings are also a product of addiction. These can be painful, constant, and distracting. Withdrawal is also a truly painful and whole body experience that occurs as a result of addiction. Once someone is addicted to substances, responding to these cravings and avoiding withdrawal become their most important needs.

A big question surrounding the science of addiction is why some people who use these substances grow addicted but others don't. Now, substance use alone doesn't cause addiction. Addiction is a complex illness that takes shape in a person based on their unique circumstances. Generally, the more risk factors that a person has, the greater chance that experimenting with drugs will lead to drug abuse and addictions. Some risk factors of addiction include- aggressive behavior in childhood, lack of parental supervision, low peer refusal skills, drug experimentation, access to drugs at school, and community poverty. However, protective factors can reduce a person's risk of becoming addicted to drugs. Protective factors can include- self-efficacy (belief in self-control), parental monitoring and support, positive relationships, good grades, school anti-drug policies, and neighborhood resources. Despite these protective and risk factors, there are some other aspects that have been discovered that play a role in addiction, and who it affects. According to scientific research, 40-60 percent of the likelihood that someone develops an addiction comes from their genetics. This is based on both a family history of addiction illnesses as well as epigenetics, which is the effects environmental factors have on a person's gene expression. Also, if someone has a mental illness such as depression or anxiety, their risk of addiction is increased. The environment in which you were raised also plays a big role in whether or not you are at risk for an addiction. These types of environmental factors can include family, school experiences, and the neighborhood you were raised in. Having been exposed to any type of traumatic experiences have been shown to increase the risk of someone developing a substance use disorder. These traumatic experiences can happen anywhere such as at school, home, or out in the community. While at home, parents or other family members who may use substances can increase the risk of their children's future substance use.

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When entering adolescence, friends and other peers can have a major influence on substance use. Teens who choose to use drugs can influence those without risk factors to try drugs for the first time. Even struggling in school or not being able to interact with others properly can put teens and children at risk for using or developing substance use disorders. Another risk factor would be choosing to use these substances at a young age. According to the National Institutes on Drug Abuse, the earlier people begin to use drugs, the more likely they are to develop serious problems with substance use. This could possibly be due to the harmful effects that drugs can have on the developing brain, or could also be a result from a mix of early social and biological risk factors. These would include the lack of a stable home or family, exposure to physical or sexual abuse, genetics, or mental illnesses. Lastly, the way that you are exposing yourself to these substances can put you more at risk for an addiction. Snorting or injecting needles are a huge risk factor because of the extreme way that the drug is being delivered into the body, and how quick the feelings fades. Scientists believe that the contrast in this action leads some people to repeatedly use drugs to recapture the fleeting pleasurable state.

Ultimately, the answer as to why some people become addicted when others don't lies in a person's unique brain chemistry and lived experiences. Many people who develop addiction are in search of a way to heal or soothe themselves in any way. Understanding why you are in search of a way to heal, and working to address that as a piece of treatment is crucial. Please remember that addiction is an illness that anyone can conquer through treatment and recovery. Many resources are provided right here at Grand Valley's Alcohol and Other Drugs Services and the University Counseling Center. There are recovery meetings such as Alcoholics Anonymous and Narcotics Anonymous which are programs open to any individuals who are trying to overcome any type of drug or alcohol use problem. If you are in search for more support in your recovery journey, our office will be holding the Knowledge Support Series where a variety of topics related to substance addiction will be discussed, as well as AOD Healthy Habits, a drop-in group for those questioning their own substance use and its effects. Links can be found on the AOD website!

Addiction is a tough topic for many to discuss, and touches us all in one way or another. More attention needs to be brought to the fact that this is an illness, not a choice or character flaw. There are so many aspects of life that play a role in addiction and who is affected. If you or someone close to you is experiencing addiction, know you are not alone. There are many resources and caring people who are here to help! This has been the fifth episode of "In The Mix" with AOD and I can't wait to be back soon with more episodes for you!