

# Alcohol And The Developing Brain



The extended use of alcohol by adolescents and young adults can have detrimental effects on their brain structures. The brain does not stop developing until the mid-twenties. Any external stimuli, such as alcohol, can affect and hinder the brain's development.

This is cause for concern because alcohol is the most used drug by this population. The younger a person is when they begin drinking, the more likely that they will experience short-term and long-term negative consequences to both their mental and physical health.

## How Alcohol Effects The Structures In The Brain

- Since the brain continues to develop into mid-twenties, damage from alcohol use by young people is a concern.
- Alcohol use can effect the brain in various ways including reduced structure size, problems with memory and judgement, and slowed down brain processes.
- Misusing alcohol at a young age increases the risk for developing alcohol use disorder.
- Due to the brains' plasticity, some restoration from damage to its structures is possible.

**Frontal Lobe:** As the largest lobe in the brain, it is involved with various important processes including managing thoughts, problem-solving, and organization. It is a vital component to the human body. Drinking at an early age can lead to a reduction in the frontal lobe size.

**Prefrontal Cortex:** This structure is responsible for planning and decision-making. It is the last structure in the brain to mature completely, and has a high risk of being affected by prolonged alcohol use. In addition, alcohol can cloud a person's judgement which can lead to risky and dangerous decisions.

**Corpus Callosum:** This structure is in the center of the brain and is responsible for communication between the left and right hemispheres. When young people begin drinking alcohol, it can lead to a reduction in size of this structure.

**Hippocampus:** This structure is primarily responsible for short-term memory, and memory retrieval. Its development is also slowed and reduced in size when young people use alcohol. In addition, alcohol use can result in problems with remembering new information.

**Amygdala:** This is the part of the brain where a person's emotional responses, especially fear, sadness, anxiety and anger are located. Alcohol use not only reduces the size of the amygdala, it also impairs one's ability to sense danger and react to those unsafe situations appropriately.

**Hypothalamus:** This structure's role is to produce hormones that control several vital functions of the human body such as hunger and thirst, blood pressure, body temperature, mood, and heart rate. When alcohol is introduced it severely hinders the structure from doing its job. The urge to urinate, eat, and drink increases while heart rate and body temperature decrease. It can be a very dangerous situation for anyone, particularly for an adolescent.



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**Cerebellum:** This structure is responsible for movement, coordination, and balance. When people consume alcohol, they often become unsteady and have problems with moving around. This can lead to avoidable accidents and injuries.

**Medulla:** This structure is responsible for controlling automatic functions of the human body, including breathing, heart rate, blood pressure, and body temperature. This is concerning because when a person drinks alcohol, it will cause their body temperature to drop. This is very dangerous for the human body as it can lead to hypothermia.

**Cerebral Cortex:** This part of the brain is responsible for working with sensory information. Consuming alcohol leads to muted sensations, including a higher threshold for pain and can lead to poor judgement.

**Central Nervous System:** When a person decides that they want to move an arm, this system signals the arm to do so. The central nervous system is the control center for body, and when alcohol is introduced to it, the body will speak, move, and even think slower as a result.

## Alcohol Use Disorder

Another cause for concern for adolescents and young adults who use alcohol is alcohol use disorder (AUD). The earlier a person begins drinking, the higher risk they'll have for developing AUD. Commonly referred as alcoholism, this brain disorder causes a person to struggle to control or stop consuming alcohol despite the occupational, social and medical consequences that they may face.

While treatment is individualized for each person, there are several commonly used approaches which are often used at the same time.

- **Behavioral Therapy:** conducted by licensed therapist, these counseling sessions target changing one's drinking behaviors. Such counseling could include mindfulness therapy, interventions, and teaching coping skills.
- **Medications:** there are three different medications currently available in this country that help people stop or reduce their drinking behaviors: Naltrexone, Acamprosate, and Disulfiram.
- **Mutual-Support Groups And Recovery Coaches:** these peer support groups help people stop or slow down their drinking behaviors. These types of groups are easily accessible in one's community and are available online as well.

## The Good News

While alcohol can harm the developing brain, there is still hope for rehabilitation of its structures. The human brain has an amazing ability to adapt and reorganize its structures and functions in response to brain damage such as a stroke or head injury. This means that there is still some ability for the brain to recover from the harmful effects resulting from alcohol use. However, prevention is the best medicine. Adolescents and young adults should avoid drinking.

## Connecticut Resources

### CT Department of Mental Health and Addiction Services

[www.ct.gov/DMHAS](http://www.ct.gov/DMHAS)

### 24/7 Access Line

1.800.563.4086

## National Resources

### Substance Abuse and Mental Health Services Administration

[www.samhsa.gov](http://www.samhsa.gov)

### National Institute on Drug Abuse (NIDA)

[www.nida.nih.gov](http://www.nida.nih.gov)

### National Institute on Alcohol Abuse and Alcoholism

[www.niaaa.nih.gov](http://www.niaaa.nih.gov)