

# Alcohol and Your Brain



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You're chatting with friends at a party when the party organizer comes around with glasses of brightly colored drinks, martinis and champagne. You drink one, then another, maybe even a few more. Before you realize it, you are laughing more loudly than usual, maybe talking nonsense, and swaying as you walk. By the end of the evening, you are too slow to move and have trouble speaking clearly. The next morning, you wake up feeling dizzy, thirsty and your head hurts. You may have a hard time remembering everything you did the night before.

## What Happen?

When you drink alcohol, it's quickly absorbed in the stomach, and the small intestine and passes into the bloodstream. The liver can only break down (metabolize) a small amount of alcohol at a time. The rest of the alcohol lingers in the bloodstream, and from the spinal cord reaches the brain and make you "feel drunk." The more alcohol you drink at once, the greater the damage.



Most people do not realize how extensively alcohol can affect them, but the reactions on the first paragraph described/illustrates how quickly and dramatically alcohol affects the brain.

Excessive alcohol use has immediate effects it increase the risk of unintentional injuries, including traffic injuries, falls, drownings, burns, or end in a medical emergency. Loss of consciousness, low blood pressure and body temperature, coma, respiratory depression, and death with a forensic report of:Alcohol poisoning.

## How Alcohol Affects on the Brain?

The brain is an intricate maze of connections that keeps our physical and psychological processes running smoothly. Disruption of any of these connections can affect how the brain works.

The brain's structure is complex. It includes multiple systems that interact to support all of the body's functions—thinking, breathing, moving. — These multiple brain systems communicate with each other through about a trillion tiny nerve cells called neurons.

The brain works balancing the signals and information that keeps the body operating at the right pace. Alcohol, can slow the pace of communication in the brain, and also can have longer lasting consequences.

Researchers are using psychological tests to evaluate how alcohol related brain changes affect mental functioning. These tests demonstrate how alcohol affects emotions and personality, as well as how it compromises learning and memory skills.

## Why Alcohol Affects on the Mood?

Alcohol causes an increased release one chemical which helps regulate emotional expression called serotonin. Also increase some natural substances that may spark feelings of relaxation and euphoria as intoxication sets in called endorphins.

Despite the presence of alcohol, some chemicals are released to create balance in the brain. But these adaptations can build alcohol tolerance and induce alcohol withdrawal symptoms.

## Why Do People Develop dependence to alcohol?

Research supported by the National Institute on Alcohol Abuse and Alcoholism (NIAAA) in the early 1990s demonstrated that people who abuse alcohol for a long time experience lasting changes to their brain. As a person's dependence on alcohol grows,the brain's reward system cause negative effects during abstinence such as anxiety, sweating and tremors. The drinker only can alleviate this discomfort for a short time, by drinking more.That's why despite recurring health and social problems, the people continue drinking to avoid the unpleasant effects.

## Alcohol Shrinks and Disturbs Brain Tissue

Heavy alcohol consumption—even on a single occasion—can throw the delicate balance of neurons off course. When alcohol causes a slow pace of communication, the neurons release the information too slowly, so you feel extremely drowsy. These alcohol-related disruptions to the neurons' balance also can trigger mood and behavioral changes, and even seizures.

Longterm, heavy drinking causes alterations in the neurons, such as reductions in the size of brain cells. As a result of these and other changes, brain mass shrinks and the brain's inner cavity grows bigger. These changes may affect a wide range of abilities, including motor coordination; temperature regulation; sleep; agitation; mood; and various cognitive functions, including learning and memory loss.

## Understanding Alcohol's Impact on the Areas of the Brain

Using brain imaging and psychological tests, researchers have identified the regions of the brain most vulnerable to alcohol's effects. These include areas involved in a variety of tasks including memory and emotion. Damage to these areas impairs each of these functions.

**1 • CEREBRAL CORTEX** – This brain region is the area involved in thinking, decision-making, plan, behave intelligently, having emotions, control in the five senses and interact socially. In addition, this area connects the brain to the rest of the nervous system. Changes and damage to this area impair the ability to solve problems, remember, and learn. Alcohol's effects on this area can impair the ability to think clearly and lower the inhibitions. It makes the person act, or react aggressively without reason and not thinking about the consequences. Alcohol may affect the senses, such as blurring vision. Long term alcohol abuse can damage permanently this region.

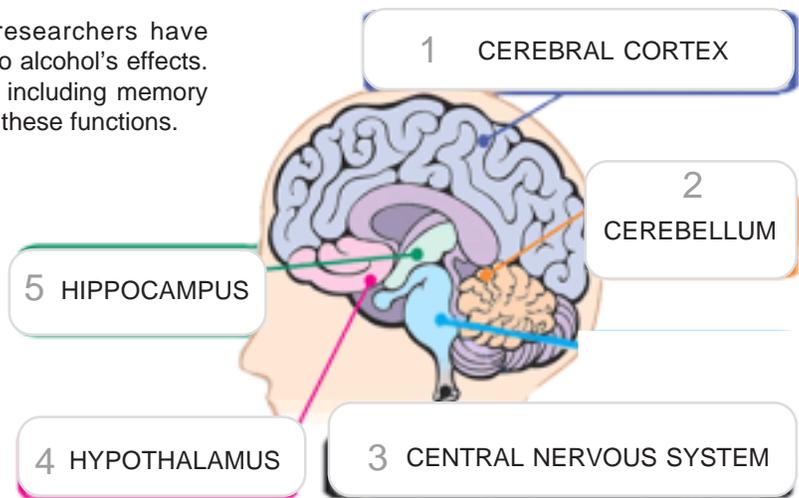
**2 • CEREBELLUM** — This area controls motor coordination, control many of the daily movements such as walking, and grabbing objects. Alcohol can slow the reflexes. Damage to the cerebellum results in a loss of balance and stumbling/shaking, and also may affect cognitive functions such as memory and emotional response.

**3 • CENTRAL NERVOUS SYSTEM** — Alcohol slows down this system which is made up of the brain, spinal cord, and nerves. Alcohol affects how signals flow through the body. It slows the process of thinking, speaking and the movements.

## Alcohol and Medications

Mixing alcohol and medicines puts you at risk for dangerous reactions. Alcohol intensifies the effects from the medications. Avoid alcohol if you are taking a medication and don't know its effect. People may have trouble concentrating or performing mechanical skills. Even small amounts of alcohol can make it dangerous to drive.

Older people are at particularly high risk. Aging slows the body's ability to break down alcohol, so alcohol remains in a person's system longer. To learn more about your medications, talk to your pharmacist or other health care provider.



**4 • HYPOTHALAMUS** – Many body processes such as heart rate and feeling of hunger or thirst, are controlled in this area. Alcohol can slow the heart rate. This area controls involuntary processes such as breathing and maintaining body temperature. Alcohol drinking in excess at one time can shut down the medulla leading to coma.

**5 • HIPPOCAMPUS** – The memory is controlled by the hippocampus. Drinking a lot of alcohol at once can cause a blackout, or forget a period of time. Long term alcohol drinking can cause permanent damage of this area. Will make difficult for a person to learn.

**The more you drink...**

**The more vulnerable your brain is.**

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## Are Brain Problems Reversible?

With studies in animals, researchers can test the effect of alcohol on animals' brains. These helps researchers to better understand how alcohol injures the human brain, and how abstinence can reverse this damage.

Abstaining from alcohol over several months to a year may allow structural brain changes to partially correct. Abstinence also can help reverse negative effects on thinking skills, including problem solving, memory, and attention.

## What factors make a difference?

Different people react differently to alcohol. That is because a variety of factors can influence your brain's response to alcohol.

Much like smoking, alcohol affects different people differently. Certain ethnic populations can have stronger reactions to alcohol, and children of alcoholics are more likely to become alcoholics themselves. So genes, environment, family history of alcoholism, and even diet can play a role in whether you develop an alcohol related disease.

Not only does alcoholic liver disease affect liver function itself, it also damages the brain. The liver breaks down alcohol. During this process, alcohol's by products damage liver and brain cells, causing a serious brain disorder called hepatic encephalopathy.

Hepatic encephalopathy causes a range of problems, from less severe to fatal. Doctors can treat hepatic encephalopathy by lowering blood ammonia concentrations that helps in removing the harmful toxins from the blood. In some cases, people may require a liver transplant.

## Fetal Alcohol Disorder Syndrome

It is not safe to drink any amount of alcohol during pregnancy. Alcohol can affect the brain even before birth. Fetal Alcohol Disorder Syndrome (FAS) has a full range of physical, learning, and behavioral problems, and other birth defects that result from drinking alcohol during pregnancy. The most serious effects are severe reductions in a brain's

function and overall growth. FAS is the leading preventable birth defect associated with mental and behavioral impairment in the United States today.

## What about Underage Drinking?

Scientists also are seeking ways to combat a major public health challenge worldwide: Underage drinking.

Adolescence is a key period in human development, a time of dramatic changes in both biological, and social. Each of these transitions can increase social pressures,

stresses, and expectations that contribute to underage drinking. Researchers have found that adolescents are more sensitive than adults to alcohol's impairment of memory and social inhibition. These findings suggest that adolescents are particularly prone to alcohol-related consequences, such as driving accident, impaired judgment and inability to measure risks, lowered inhibitions, risky sexual behaviors, and lasting cognitive deficits. In addition, the earlier drinking begins in adolescence, the greater the risk of alcohol use disorders in adulthood.

### WARNING.

Excessive alcohol use hurts us all. It reaches into every aspect of society and has an economic impact as well.

## Help is available

There are many resources where people can get information on alcohol problems. For more information on these services, call the multi-lingual Access and Crisis Line at:

**1-800-477-3339**

Trained counselors are available to assist 24 hours per day, 7 days per week, or visit:

**[www.sdads.org](http://www.sdads.org)**



County of San Diego Health and Human Services Alcohol and Drugs Agency funds a variety of free and low-cost services for teens and their families.

County of San Diego Alcohol and Drug Services, ADS provides an integrated system of community based alcohol and other drug prevention, intervention, treatment, and recovery services throughout San Diego County.

