

Alcohol contains a drug known as ethanol. Ethanol is a depressant—it slows down brain activity, reflexes and other physical skills. Alcohol is the most abused drug in the United States.

**Short-Term Risks:**

- Makes it harder to think clearly and make good decisions, which can lead to problems like unwanted pregnancy, STDs, or involvement in a crime
- Changes vision, balance and coordination—all of which greatly increase the risk of an accident, such as a car crash or drowning
- Too much alcohol too quickly can lead to alcohol poisoning—blackouts, coma or death
- Can change behavior and emotions, making a person act foolish, clumsy, angry or loud
- Can cause painful “hangover” symptoms—headache, sleepiness, dizziness, stomach pains, vomiting and diarrhea
- Can cause bloodshot eyes, pimple breakouts, and bad breath

**Long-Term Risks:**

- Lowers the body’s immune system and can increase the risk of diseases
- Cancer of the mouth and throat
- Cirrhosis of the liver, a disease that is often fatal
- Painful stomach ulcers
- Cancer of the pancreas
- Weakened heart muscles and an irregular heartbeat
- Permanent brain damage
- Kidney failure
- Weakened muscles and bones
- High blood pressure
- Rotten teeth
- Weight gain

**ALCOHOL & THE BRAIN: NEW FACTS**

- Since their brains are still developing, teens who drink heavily are more likely to significantly lower their mental abilities than adults who drink heavily.
- The part of the brain most at risk appears to be the hippocampus, a structure responsible for learning and memory. Also at risk is the prefrontal cortex, an area responsible for decision making.
- The effects on the brain can include loss of motor skills, a lessened ability to perform on tests, and a greater difficulty learning new things.
- Studies suggest that early damage caused by heavy drinking as a teen can surface later in life.
- The average size difference between the brain of a healthy teen and the brain of a teen who drinks heavily is about 10 percent.
- Just a few years of heavy alcohol use by a young person can lower brain function and change the ability to learn.
- Young brains are also more vulnerable to changes that can lead to alcohol addiction. Forty percent of alcoholics began drinking before age 15, while only 10 percent began drinking at age 21 or 22.
- In a number of studies, tests show that habitual alcohol drinkers perform more poorly on cognitive tests than those who abstain from alcohol.
- Alcohol decreases the transmission of nerve signals. During withdrawal from intoxication, the brain attempts to recover by increasing transmission. Scientists believe that this overstimulation of the brain causes neurons to break down inside their own membranes and die.
- Research shows that a teen's brain is more easily damaged than an adult's brain in the areas that regulate the storage of memories.
- Alcohol can also cause emotional changes during a time when the brain is learning to deal with new and powerful feelings. That can lead to problems with friends, cause low self esteem, and raise stress levels.

**Sources:**

Fackelmann, Kathleen. "Teen drinking, thinking don't mix." *USA Today*, online article, October 17, 2000

Wuethrich, Bernice. "Getting Stupid." *Discover*, Volume 22, No. 3, March 2001

Binge drinking by a male is defined as downing five drinks in one sitting. For a female, the definition is four drinks in a sitting.

- ▶ People who binge drink frequently are ten times more likely to drive drunk than non-bingers.
- ▶ People who binge drink frequently are sixteen times more likely to get in a car with a drunk driver than non-bingers.
- ▶ Nearly three percent of the American college population will die from alcohol-related causes.
- ▶ 30 percent of academic failures by college students are alcohol-related.
- ▶ 90 percent of all vandalism on college campuses is alcohol-related.
- ▶ Alcohol is involved in two-thirds of college suicides, 90 percent of campus rapes, and 95 percent of violent crime on college campuses.
- ▶ Students who binge drink are twice as likely to die from injuries as non-bingers.
- ▶ Approximately 80 percent of all binge drinkers have had a hangover as a result of drinking.
- ▶ Approximately 50 percent of all binge drinkers have done something they later regretted as a result of drinking.
- ▶ Approximately 40 percent of all binge drinkers have blacked out as a result of drinking.
- ▶ Approximately 30 percent of all binge drinkers have had unplanned sex as a result of drinking.
- ▶ Approximately 15 percent of all binge drinkers have had unprotected sex as a result of drinking.
- ▶ Approximately 30 percent of all binge drinkers have argued with friends as a result of drinking.
- ▶ Approximately 45 percent of all binge drinkers have missed a class as a result of drinking.
- ▶ Approximately 30 percent of all binge drinkers have gotten behind in school as a result of drinking.

**Source:** *Binge Drinking on Campus*, Report by Harvard School of Public Health, 1998

**ALCOHOL AND THE BODY**

When you drink alcohol, it is absorbed directly into your bloodstream and then into your body systems. Here is how alcohol can affect different parts of your body:

**THE BRAIN**

Alcohol is a depressant. That means it slows down all the major functions of the central nervous system, causing slurred speech, mental confusion, blurry vision, and poor muscle control. If enough alcohol is consumed, it severely impairs the functioning of the respiratory system, and can arrest breathing. Prolonged alcohol use can cause confusion, memory loss, and brain damage.

**THE LIVER**

The liver works to cleanse the system of toxins. Alcohol is a toxin. Once alcohol enters the blood, the liver tries to rid the bloodstream of it. Prolonged alcohol use can cause hepatitis, cirrhosis of the liver, and liver cancer.

**THE STOMACH**

The stomach also tries to remove toxins from the body—usually by vomiting. If enough alcohol is consumed, it causes vomiting. Prolonged alcohol use can inflame the lining of the stomach and cause ulcers.

**THE MUSCLES**

Prolonged alcohol use can cause weakness and loss of muscle tissue.

**THE HEART**

Prolonged alcohol use can cause high blood pressure, an irregular pulse rate, and an enlarged heart.

**THE PANCREAS**

Prolonged alcohol use can upset digestion and cause severe pain, malnutrition, and early diabetes.

**THE NERVOUS SYSTEM**

Prolonged alcohol use can cause tingling and numbness in both the hands and feet.

**THE REPRODUCTIVE SYSTEM**

Prolonged alcohol use can cause also impotence in males. In females, it can increase the risk of menstrual problems and it can severely damage the fetus of a pregnant woman.

1. Alcohol affects everyone the same way.

**Many factors affect reactions to alcohol, including body weight, mental state, and time of day. Young people are more negatively affected by alcohol than adults because their minds and bodies are still developing.**

2. Drinking alcohol is part of growing up.

**Millions of young people choose not to drink. For them, there are dozens of other activities and events that signify growing up. Using alcohol and other drugs is not a “necessary” step in the path to adulthood.**

3. Beer will not do permanent damage.

**All forms of alcohol present risks for the mind and body. A beer contains the same amount of alcohol found in a glass of wine, a wine cooler, a shot of whiskey, or the average mixed drink. Large amounts of alcohol, in any form, can do damage to the brain, heart, liver, and stomach.**

4. The worst thing that can happen to a drinker is a bad hangover.

**The risks of drinking go far beyond the effects of a hangover. These risks include alcohol poisoning, car crashes, suicide, involvement in a crime, and unprotected sex leading to pregnancy or a sexually transmitted disease.**

5. It’s much worse for a teenager to use drugs than to drink alcohol.

**First of all, alcohol is a drug. In fact, it is the most abused drug in our society. It leads to addiction and health problems that destroy lives. Secondly, drinking alcohol at an early age increases the risk of alcohol addiction, as well as addiction to other drugs.**

6. Harm to the body doesn’t happen until much later, after years of drinking.

**New research proves that drinking alcohol can have long-lasting effects on a person’s brain function—especially when the person drinks heavily at a young age. These effects can become evident immediately after drinking and may last for many years.**

7. Adults have drinking problems more often than young people.

**Alcohol addiction can happen to anyone. In fact, the younger a person starts drinking, the greater the risk of addiction. Many people wrongly believe that alcohol addiction is primarily an adult problem because those seeking treatment are most often adults. That’s because it takes most people years to recognize, understand and accept their addictions.**

**THE LEADING KILLERS OF PEOPLE UNDER 18 ARE:**

**MURDER** - Half of all murderers were under the influence of alcohol at the time of the murder.

**CAR CRASHES** - Almost 3 out of 4 young people who die in car crashes were riding with a driver who had been drinking alcohol.

**SUICIDE** - 1 of 3 suicides happen to someone who is under the influence of alcohol.

These were not accidents, but choices made by people who were drinking.

**OTHER RISKS:**

Having one drink after another, or binge drinking, is becoming a serious killer of young people. Binge drinking can cause alcohol poisoning, which can lead to coma or sudden death.

Hundreds of kids under 15 are taken to emergency rooms each year for alcohol poisoning. In addition to death, alcohol poisoning can cause heart, liver and brain damage.

Young people are more likely to become addicted to alcohol. It takes 5 to 10 years for an adult to become addicted to alcohol, but a young person can become addicted in just 1 or 2 years.

On average, young people who drink alcohol have lower grades and a higher risk of dropping out of school. Students who drink are also 5 times more likely to fail a grade.

Many young people who get arrested have been drinking alcohol.

It is against the law for people under 21 to use or buy alcohol, even if they are at home.

For teens, alcohol is a major factor in date rapes, unwanted pregnancy and the contraction of STDs like HIV.

Teens are more likely than adults to lose control and make poor decisions. Teens who drink have a higher risk of involvement in fights, vandalism and violent crimes.

The following terms are frequently used by researchers who examine the link between alcohol and brain function.

**neurons** - nerve cells, such as those found in the brain

**axon** - a single fiber extending away from a neuron which releases chemical messengers called neurotransmitters

**neurotransmitters** - chemical messengers which allow neurons to communicate with other cells and cause changes in the brain and throughout the body

**receptor** - area of a neuron which receives a neurotransmitter

**synapse** - tiny gap between two neurons; point at which a nerve impulse passes from one neuron to another

**hippocampus** - structure buried deep in the brain; responsible for many types of learning and memory

**prefrontal cortex** - area of the brain responsible for the ability to plan ahead, think abstractly and make good decisions

**potentiation** - process which occurs when repeated use of synapses is followed by an increase in their ability to carry impulses to other cells

**glutamate** - an important neurotransmitter which causes neurons to fire more rapidly

**MRI (magnetic resonance imaging)** - medical technology which uses a large magnet to produce images of the brain or other internal organs

**dopamine** - a neurotransmitter that creates feelings of pleasure when it is released by the brain

**YOUR BRAIN AND YOUR FUTURE**

1. In the space below, list five things you want to do with your mind before you turn 40. Some ideas might be writing a book, learning to speak a new language, teaching a class on your favorite subject, inventing a new product—even curing a disease. Try to be very specific with your ideas and make sure they are goals that truly interest you.

1.

2.

3.

4.

5.

2. Now think about what you have learned about alcohol and the brain. Heavy drinking has been shown to lessen brain size and decrease the ability to think, remember and perform. Explain how heavy drinking might affect each of your goals.

1.

2.

3.

4.

5.