

# The Problem: Learn the Facts

## The sobering truth about underage drinking

"The brain goes through dynamic change during adolescence [ages 12-21] and alcohol can seriously damage long- and short-term growth processes." (American Medical Association Fact Sheet, 2003)

New imaging machines, such as MRIs, PET, and SPECT scans, have given scientists exciting views into the development of the human brain. While we once thought the brain was fully developed at birth, now we know that the brain continues to develop until the mid-twenties. New scientific research has also shown that alcohol affects a teen's still-developing brain differently than an adult brain and can harm brain development. Alcohol slows down brain activity; and the negative affect of alcohol lasts far longer in a teen brain than in an adult (up to two weeks). If a teen uses alcohol before his or her brain is fully developed, it can keep the good judgment and impulse-control part of the brain from properly developing or "wiring." It can also damage the memory and learning areas of the brain; and it greatly increases the risk of alcohol addiction. Underage drinking also increases the risk of mental illness, and contributes to other anti-social behavior. More teens die as a result of alcohol use than all other illegal drugs combined (*Youth Risk Behavior Surveillance, 2002*).

## Surgeon General issues a national "Call to Action"



In response to a growing national concern over the new teen alcohol-brain-damage research, the U.S. Surgeon General issued a "Call to Action" in early 2007 declaring: "I have issued this 'Surgeon General's Call to Action To Prevent and Reduce Underage Drinking to focus national attention on... new, disturbing research which indicates that the developing adolescent brain may be particularly susceptible to long-term negative consequences from alcohol use.

Recent studies show that alcohol consumption has the potential to trigger long-term biological changes that may have detrimental effects on the developing adolescent brain, including neuro-cognitive impairment. ... Adolescent alcohol use is not an acceptable rite of

passage but a serious threat to adolescent development and health."

## Drinking is a problem in Idaho - and it's starting earlier than ever

In Idaho, kids are starting to drink in as early as the sixth grade. Most parents, however, are unaware of their child's alcohol use. They think, "Not my kid." In a national survey, 31 percent of kids who said they had been drunk in the past year had parents who believed their children were non-drinkers.

Parents often believe that their church teachings or school policies keep their kids from using alcohol, but too often that is not the case. To add to the problem, It is important to set rules early about not drinking alcohol--before age eight is ideal. Parents then need to monitor children to make sure those rules are kept.

Underage Drinking and Driving Fatalities	2008
Youth Under 21 Alcohol-Impaired Driving Fatalities	10

High School Underage Drinking 2009	2009
Ever had at least 1 drink of alcohol on at least 1 day (during life)	62.5%
Drank alcohol for the first time before age 13 years	19.2%
Had at least 1 drink of alcohol on at least 1 day ( last 30 days)	34.2%
Had five or more drinks of alcohol in a row within a couple of hours on at least one day (last 30 days)	22.3%
Usually obtained the alcohol they drank by someone giving it to them	41.4%
Had at least one drink of alcohol on school property on at least one day ( in last 30 days)	3.5%

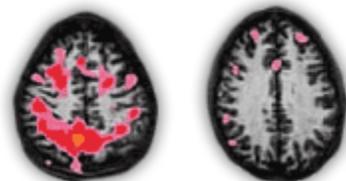
Resources:  
 Alcohol- Impaired Driving Data: U.S. Department of Transportation, National Highway Traffic Safety Administration, Idaho Traffic Safety Facts 2009  
 CDC High School Youth Risk Behavior Survey 2009

## The Problem: Brain Impairment

Research reveals brain impairment in teen drinkers

**Which brain activity scan do you want for your child?**

These images show functional activity levels in the brain of a healthy 15-year-old male nondrinker (left), and that of a 15-year-old male heavy drinker (right).



Researchers at major medical schools across the U.S. used various imaging techniques to measure brain impairment in teen drinkers compared with non-drinking teens. One, Dr. Susan Tapert, at the University of California - San Diego invited local high school students (non-drinkers and drinkers) to have an MRI done on their brains. She gave the volunteers (who were all sober at the time) identical thinking tests which appeared on an overhead screen during the MRI. Teens who admitted to heavy drinking showed much less brain activity (visible by the absence of red color) than the non-drinkers.

*(More of Dr. Tapert's teen brain scans can be seen in two videos: "Don't Drain Your Brain" and "Brain Scans" from Human Relations Media - [www.hrmvideo.com](http://www.hrmvideo.com). Your local library or school district substance abuse specialist will likely have a copy of the videos for viewing.)*

### **Which brain do you want for your child?**

These SPECT images show functional activity levels in the brain of a healthy nondrinker (left), and that of a sober 21-year-old with a four-year history of heavy alcohol use (right).

The "holes" indicate areas of reduced brain activity.



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Dr. Daniel Amen, a neuroscientist and psychiatrist in Southern California, uses SPECT scans to image and view the brain. These SPECT images show functional activity levels in the brain of a healthy non-drinker (left), and that of a sober 21-year-old with a four-year history of heavy alcohol use (right). The "holes" indicate areas of reduced brain activity.

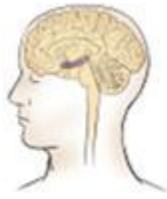
*(More of Dr. Amen's brain scans can be seen in "The Truth About Alcohol" from Aims Multimedia - [www.aimsmultimedia.com](http://www.aimsmultimedia.com). Your local library or school district substance abuse specialist should have, or can obtain, a copy for your viewing.)*

## **Two brain areas negatively affected by underage alcohol use**

Two brain areas that are negatively affected by underage alcohol use are the prefrontal cortex (the area right behind the forehead) and the hippocampus (deep inside the brain). These quotes are from the *American Medical Association Fact Sheet*:<sup>2</sup>



"The prefrontal area [responsible for good judgment, planning, decision making and impulse control] undergoes the most change during adolescence. Researchers found that adolescent drinking could cause severe changes in this area, which plays an important role in forming adult personality and behavior. Damage from alcohol at this time can be long-term and irreversible."



"The hippocampus [involved in learning and memory] suffers from the worst alcohol-related brain damage in teens. Those who had been drinking more and for longer had significantly smaller hippocampi (10 percent). In addition, short-term or moderate drinking impairs learning and memory far more in youth than adults. Frequent drinkers may never be able to catch up in adulthood, since alcohol inhibits systems crucial for storing new information."

### **Alcohol damage can cause young people to exhibit the following behaviors:**

- develop social problems
- have poor judgment
- get into trouble
- struggle in school
- experience failure in achieving life-long goals <sup>10</sup>

Simply put, underage drinking can hinder a teen's brain-wiring development, damaging the impulse control and good judgment area of the brain, and harming the learning and memory parts of the brain. Alcohol damage can cause young people to: develop social problems, have poor judgment, get into trouble, do poorly in school, and experience failure in achieving life-long goals. While the damage may not show up right away, when the person has to solve some complex relationship problems or perform complex higher-level math problems, performing those mental tasks may be harder for him or her.

## **The Problem: Alcoholism**

### **Underage drinking can "program" the brain for alcoholism**

Another grave concern is the greatly increased risk of alcoholism for teen drinkers. Research shows kids who begin drinking before age 15 have a 40 percent chance of becoming alcohol-dependent. In contrast, a person who waits until the legal age of 21 to start drinking only has a 7 percent chance of becoming an alcoholic. <sup>4</sup> (Note: Some people are genetically predisposed to alcoholism. Their brains react with greater intensity to the alcohol-produced dopamine rush. If a person has a relative who is an alcoholic, he or she is at much higher risk; and to be safe from alcoholism, should probably not drink at all.)

Here's why: The brain is hard-wired to reward positive actions (those that benefit the human race or contribute to the survival of the species) with feelings of pleasure so we want to repeat them. These can range from an intense emotional "high" to a happy sense of satisfaction from doing something well or performing a kind deed. We remember pleasure from dopamine, a "feel-good" brain chemical, or neurotransmitter, which associates the pleasure to the thing we enjoyed.

Alcohol tricks the brain's pleasure-reward system by stimulating the production of dopamine. It thus creates feelings of pleasure from a harmful chemical instead of a real experience. Because the teen brain produces an abundance of dopamine (compared to an adult brain), it can rapidly go from liking, to wanting, to needing alcohol, thus programming it for alcoholism.<sup>6</sup>

Alcohol can also damage the brain's ability to sense pleasure from normal, healthy things and experiences, leaving a young person feeling "flat" about activities he or she previously enjoyed.<sup>7</sup> For heavy teen drinkers, nothing else seems as fun anymore. Because the pleasure-reward system is becoming damaged by heavy drinking, after a while it takes more and more alcohol to create the same amount of pleasure, resulting in addiction. There are about 16 million alcoholics in the United States and about one-fourth are teens.

Alcoholism is a terrible fate for a young person. They become irritable and moody, as the craving for the next drink is a constant nagging presence. Getting the next drink becomes more important than grades, sports, or other activities they used to enjoy. Often, they fail to realize their full potential, and they feel trapped. It is also a terrible fate for their parents who often end up bailing the kid out of trouble-like paying their rent or tending grandchildren the addicted parent is unable to care for. Society is also burdened as it picks up the social clean-up costs of welfare, drunk driving, child neglect, spouse abuse, etc.

Underage drinking, with its high risk of alcohol addiction, is a lose-lose proposition for everyone concerned-except the alcohol companies who profit at the kids' expense.

In addition to alcoholism, teens who drink are far more likely to try illegal drugs. In fact, research shows that 67 percent of teens who drink before the age of 15 will go on to use illegal drugs.<sup>8</sup> They are 22 times more likely to use marijuana, and 50 times more likely to use cocaine. Further, 95 percent of meth users began drinking before the age of 15.

## Underage drinking linked to mental health problems



Not only do teens who use alcohol often progress to addictive behavior later in life, according to an article entitled "*Alcoholism: Clinical and Experimental Research*, published in August 2005 from Albert Einstein College of Medicine, "They are at a higher risk for developing mental illnesses such as depression, suicide, and psychoticism as adults." In an August 2002 *Leadership to Keep Children Alcohol Free* report by the U.S. Department of Health and Human Services, the following statistics were given:

- 1.) Among 12- to 17- year-olds who were current drinkers, 31 percent exhibited extreme levels of psychological distress and 39% exhibited serious behavioral problems. 2.) 12- to 16- year-

old girls who were current drinkers were four times more likely than their non-drinking peers to suffer depression. 3.) Suicide attempts among heavy-drinking adolescents were three to four times greater than among non-drinkers. 4.) Among eighth grade girls who drink heavily, 37 percent report attempting suicide, whereas 11 percent of girls who do not drink report attempting suicide.

## Underage drinking can lead to a host of other problems

Underage drinking isn't a harmless rite of passage. Alcohol use among children is strongly correlated with violence, poor academic performance, promiscuity, arrest and many other dangers. In fact, alcohol use by teens is one of the strongest predictors of teen injury, fighting, academic problems, truancy, unprotected sexual activity, unwanted sexual advances, illegal activity and other illicit drug use.

## Underage drinking can kill

Alcohol poisoning from underage drinking is more likely to kill young people than all other illicit drugs combined.<sup>13</sup> Here's why: Unlike adults, most kids' brains haven't yet developed the internal "cut-off" switch that makes them go to sleep or pass out from drinking too much alcohol. They can easily consume dangerous amounts of alcohol before they realize the harm. The resulting alcohol poisoning can cause difficulty breathing, unconsciousness and death. It is important to note that the lethal dose of alcohol is just a tiny bit more than the passing-out dose. If a young person ever passes out from too much drinking, 911 should be called for immediate medical attention.

In addition to alcohol poisoning, traffic accidents are the #1 killer of teens; and more than one-third of teen traffic deaths are alcohol-related. Even non-drinking teens are at risk if they get in a car with an alcohol-impaired driver.

Some parents may question setting a no-alcohol rule because they drank as a teen and feel they "turned out fine." New research shows teens today begin earlier and drink more than adults at a sitting, putting them at far greater risk for addiction and brain damage. All parents need to set firm no-alcohol boundaries.

## Teens aren't prepared to deal with the risks of alcohol

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The brain areas that encourage impulsivity and risk-taking develop early in a teen, while areas that improve self-control and inhibit impulsive behavior don't develop until the very late teens or early 20s. Teens need parental help to stay alcohol-free.

The good news is, teen alcohol use is not an inevitable rite of passage. Research shows that addiction begins (and can be prevented) in adolescence: "A child who gets through age 21 without smoking, abusing alcohol or using illegal drugs is virtually certain never to do so." (Joseph Califano, The National Center on Addiction and Substance Abuse at Columbia University, 2006) Parents can make a powerful difference in their child's decision to remain alcohol-free by learning and applying the research-proven skills of **BONDING**, **BOUNDARIES**, and **MONITORING**.

## The Problem: References

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