



New Research on Adolescent Brain Development

DO YOU EVER FEEL like you are on a roller coaster ride with your teenage son or daughter? One day everything seems fine and the next there are emotional outbursts, risk taking, rule breaking, etc.?

Until recently teen behavior was largely attributed to raging hormones. Recent research on the brain now sheds new light on what really goes on inside teens' brains.

Magnetic Resonance Imaging (MRI) has shown that the teen brain is a work in progress.¹ We used to think the brain was fully mature by the age of 10 or 12, but new findings indicate that this may not be true. While brain researchers are cautious about interpreting their results, here is some of what we know so far:

- The brain continues to develop (mature) in the teen years and even into the 20s.²
- The parts of the brain responsible for sensation seeking are really 'turning on.' Teens seek higher levels of novelty and stimulation to achieve the same feeling of pleasure as adults.³
- The part of the brain responsible for exercising judgment is still maturing—it's like turning on the engine of a car without a skilled driver at the wheel.⁴
- Adolescents rely heavily on the part of the brain associated with emotional and gut reactions. Research found that those under age 14 tend to misread facial and emotional signals, seeing anger and hostility where there is none. Hence, it's easy to see that a teen might rant, "My teacher hates me!"⁵
- Teens have less activity in the part of the brain that directs motivation. That's why it is hard to get them going on that all important homework assignment.⁶
- The gland at the base of the brain that regulates melatonin levels, the teen's biological time clock that signals nighttime, takes longer to rise in teens. Consequently the brain's program for starting nighttime is later. This affects a teenager going to bed and getting up on a 'reasonable' schedule.⁷
- The teen brain has more plasticity (the ability to be shaped and molded) than the adult brain. This appears to make the adolescent brain more vulnerable to the disruptive affects of alcohol and drugs.⁸

➤ Alcohol impairs learning and memory, specifically with establishing new memories. Abuse of alcohol by teens may have long-term negative effects on the make up of their brains.⁷

➤ Teens may be less sensitive to the effects of alcohol, which may allow teens to drink longer than adults. Teens also increase their risk of brain damage even if drinking the same amount of alcohol as adults.⁶

Adolescents are more vulnerable than any other age group to developing nicotine, alcohol, and other drug addictions because the regions of the brain that govern impulse and motivation are not yet fully formed.⁸

What should a parent do?

Help your teens make up for what their brains lack by providing structure, organizing their time, guiding them through tough decisions (even when they resist) and applying those time-tested parental virtues: patience and love.⁴

Sources Cited in Adolescent Brain Development article:

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⁴Park, Alice. "What Makes Teens Tick," *Time*, Vol. 163, No. 19, May 2, 2004.

⁵Yurgelun-Todd, D. 2002, Frontline interview 'Inside the Teen Brain' on PBS.org. Full interview available on the web at <http://www.pbs.org/wgbh/pages/frontline/shows/teenbrain/interviews/todd.html>

⁶White, A.M., Jamieson-Drake, D. & Swartzwelder, H.S. 2002, 'Prevalence and correlates of alcohol-induced blackouts among college students', *Journal of American College Health*, n.151, pp.117-31.

⁷Brown, A., Tapert, S., Granholm, E. & Delis, D. 2000, 'Neurocognitive functioning of adolescents: Effects of protracted alcohol use', *Alcoholism: Clinical and Experimental Research*, n.24, pp.164-71.

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Eye On Prevention

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Senate Business & Labor Committee
Hearing on House Bill 348

March 11, 2005

Dear Mr. Chairman and Members of the Committee:

For the record, my name is William Muhs, and I represent Mothers Against Drunk Driving. I also had the privilege of serving on the Governor's Task Force on Alcohol, Tobacco, and Other Drugs.

Mr. Joseph Califano, Chairman of the National Center on Addiction and Substance Abuse stated that there is, by any public health standard, an underage drinking epidemic in America. Teens are drinking 10-12 % of the alcohol sold in our nation and over 5 million high school students binge drink at least monthly. Drinking is teen America's fatal attraction – alcohol is too often implicated in the three top causes of teen deaths: traffic fatalities, homicide, and suicide. Alcohol kills 6.5 times as many youth as all other drugs combined. Kids start drinking earlier today, 36% by the 8th grade or earlier. Both boys and girls. The average age for that first drink is 13.1 years yet medical experts tell us that the brain is not fully developed until age 21. Alcohol is not only the gateway drug but also the drug of choice for today's youth.

By almost any measure, Montana ranks far worse than the national averages when it comes to underage drinking. Montana kids drink more and drive drunk more – by a significant percentage. In 2001, 51% of our youth highway fatalities were alcohol-related, versus 38% for the nation. Montana's youth have the second highest rate of illicit drug use and the fourth highest rate of alcohol use of all 50 States. In one large Western Montana School District, a recent survey showed that about 19% of eighth-graders, 35% of 10th-graders and 43% of 12th graders consider themselves heavy users of alcohol or binge drinkers. National numbers are 6% for 8th-graders and at 18.7% for youth ages 12-20.

Most youth do not drink at home but drive somewhere else to drink. Keg beer is the alcohol of choice for teen parties because it is the cheapest form of alcohol and it only requires one purchase – usually by an adult. Kegs are a cheap and easy way to get a lot of people drunk at one time. Each glass of beer can cost as little as 25-30 cents when dispensed from a keg. Frequently public property is damaged or destroyed during these keggers. Unfortunately, these keg parties often involve excessive consumption than can result in alcohol poisoning, injuries, and death in traffic crashes.

When police break up a key party involving underage drinking, people scatter and they usually have no way of knowing who is responsible for providing the alcohol to minors. However, if HB 348 is implemented, police will have the tools to track down the purchaser and impose the appropriate sanctions. Thus, keg registration can serve as a deterrent to adults who might otherwise buy keg beer for youth when they realize they could face financial and legal

consequences for their actions. The retailer is also relieved of any potential liability recourse under this system. Twenty-four states have passed keg registration laws and NHTSA calls keg registration an integral part of its comprehensive youth DUI enforcement strategy. Keg registration was also a consensus recommendation of the Governor's Task Force on Alcohol, Tobacco, and other Drugs.

Underage drinking prevention requires a comprehensive effort involving police, parents, retailers, community groups, and legislators. Keeping keg beer out of the hands of youth should be a priority in Montana. Increasing the sanctions to those who sell alcohol to our youth can also serve as a powerful deterrent to illegal sales of alcohol and the life-threatening situations they can cause. We urge your support of HB 348. Thank you.

Sincerely,

William Muhs
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Member, Governor's Task Force on Alcohol, Tobacco, and Other Drugs