

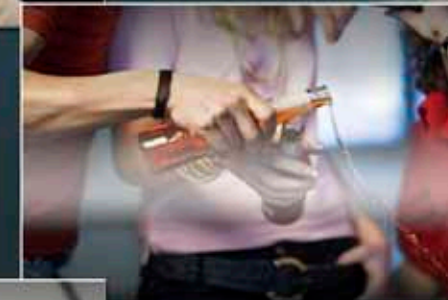
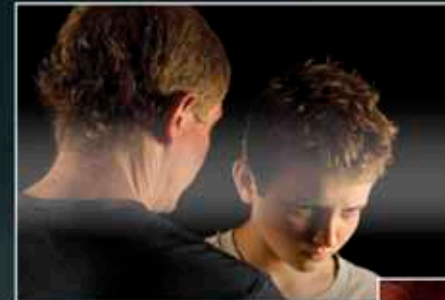
Delaying That First Drink: A Parents' Guide



ADVANCING SCIENCE, SERVING SOCIETY

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ADVANCING SCIENCE, SERVING SOCIETY

Delaying That First Drink: A Parents' Guide

Written by: Aimee L. Stern

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

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Our Facebook page: www.facebook.com/pages/Science-Inside-Alcohol/33451484521

Science NetLinks (Lessons on the science of alcohol for teachers):

www.sciencenetlinks.com/lessons.php?DocID=502

The Science Inside Alcohol eBook (Learning for middle school students):

www.sciencenetlinks.com/alcohol/ebook/

Our Web site: www.aaas.org/programs/education/ScienceInside/alcohol/alcohol.shtml

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The Science Inside Alcohol Project is funded by the National Institute on Alcohol Abuse and Alcoholism (NIAAA). NIAAA is devoted to researching how alcohol affects us, the most effective ways to educate others about it, and helping those who have addiction problems. Our project's goal is to help parents and teachers convince kids to delay drinking by explaining the science of how alcohol affects their bodies. This book was produced under Grant #1R25AA01607-01A1.

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AAAS' Science Inside Series

The Science Inside series is AAAS' premier education tool to improve public understanding of science. The award-winning series develops and broadly shares plain language electronic and print materials focusing on scientific concepts that are important to the general public.

Here are some books that may be useful to parents. They can be accessed online at www.aaas.org/programs/education/ScienceInside/ or if you contact msosa@aaas.org she can send you printed copies.

The Science Inside: Asthma & Allergies

This booklet explains what asthma and allergies are, how they are related, who suffers most from them, how they are prevented, and how they are treated. It also discusses the current research being conducted on these conditions, as well as the important role volunteers play in clinical trials.

The Science Inside: Having Healthy Babies

Health professionals know a great deal about what it takes to have healthy babies and it's summarized in here. Women can learn how to avoid or reduce the health risks of pregnancy, about the development of healthy infants and toddlers, and the steps of pregnancy from conception to labor, and delivery to postnatal care.

The Science Inside: Learning

This easy to understand and engaging text provides an introduction to how people learn, from infancy to old age. Drawing upon what we have learned from research on learning and the brain, the book places the study of learning in an everyday context that makes it appropriate for a wide range of audiences, especially informal and formal educators and parents.

The Science Inside: Obesity

The obesity booklet discusses the importance of good health habits such as eating right and exercising. It talks about how the body takes in energy and what it does with excess energy it doesn't use up. It also discusses how to prevent and treat obesity. This booklet was named a 2007 Health Information Award winner by the Health Information Resource Center. www.healthlit.org

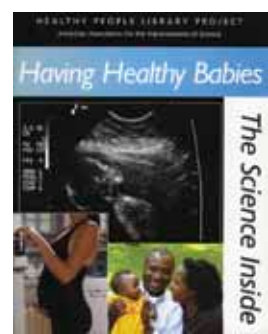
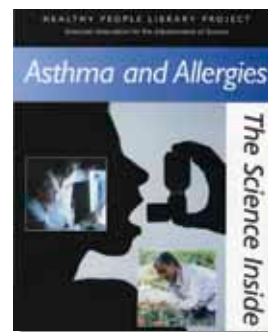


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Aimee Stern, who wrote and researched this book, is the president of Stern Communications in Silver Spring, Maryland. Aimee's blog <http://delaythatfirstdrink.blogspot.com/>, aimed at parents of middle and high school students, addresses social and physical sciences, as well as resources and parent to parent advice. Aimee is also a guest blogger for the Partnership for a Drug Free America's Decoder Blog.

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Introduction

While researching this book, I went to the 2009 meeting of the International Conference of Young People in Alcoholics Anonymous (ICYPAA). More than 2,200 people spent a holiday weekend talking about alcohol, prayer, why they no longer drink, and the Twelve Steps they all believe saved their lives.

Many told family stories that could make you cry, of alcoholic or drug addicted parents, or drinking to feel better, and in many cases as they put it, just to “feel normal.” Others talked of families with one or two loving parents in what they considered a good home, and sneaking alcohol from a young age.

The majority of those I met and listened to:

- Started drinking in middle school or the first year of high school. Ages ranged from nine (drinking vanilla extract from the kitchen cabinet) to 14 (when alcohol and drugs became easier to get).
- Had problems with multiple addictions to alcohol and drugs.
- Came from families with a history of alcoholism and drug addiction.
- Felt awkward or different from other children all through school, didn't have many friends, and described their first drink as making all of that go away.

These meetings are held under a veil of secrecy (only first names and last initials are used), and I was not allowed to report from any of the sessions. The stories of teen alcoholics in this book

were volunteered during interviews set up by the group.

Why do teens drink, and can we as parents give them information and support that may stop them? That's the subject of this book, a joint effort from the American Association for the Advancement of Science (AAAS), the world's largest general science society, and Stern Communications, a DC-based publishing and public relations firm specializing in science and health. We are supported by a grant from the National Institute on Alcohol Abuse and Alcoholism (NIAAA).

All parents hope that their child will not be the one who gives in to alcohol and drug abuse. But as our children get older and more independent, it's harder to keep watch and control what they do.





“Just Say No,” that famous anti-drug and alcohol campaign, started by Nancy Reagan in the 1980s, has not done enough.

The Internet can help parents monitor their kids’ alcohol and drug use. I finally told my eighth grader he could go on Facebook. The caveat? He had to friend me. I read the conversation and learn a lot about what’s really going on.

How can you stop a teen from behaving like a teen when alcohol is offered? Try science. It’s another way to talk with your children, an option. And a very powerful one.

Adolescents love to argue with their parents. If a parent says, “Don’t do that,” you can almost bet they will. But they can’t argue with science.

The Science Inside Alcohol Project, as ours is called, is also developing a middle school curriculum, explaining the science of how alcohol affects adolescents’ bodies, and an e-book for students. In these pages, we detail how alcohol affects the adolescent brain, liver, and multiple body systems, and explore the consequences of those changes.

Conversations about alcohol and drug use should begin before late elementary school, if possible, and continue as long as teens are still listening. Science is a powerful tool in the arsenal of ways parents can talk to their kids about Delaying That First Drink. We hope it helps.

Aimee L. Stein

What the Research Tells Us



QUICK FACT

Twenty eight percent of 12 to 17 year-olds said alcohol and drug use is their biggest problem. Only 17% of parents list it in their top ten.

When your kids go off to middle school, they enter a completely unknown world. In elementary school, you have a lot of contact with teachers, know the principal, attend fundraisers, and more. You meet other parents. They may not be friends, but they're not strangers. The close-knit community is dependable. Your child is safe. (You hope).

Middle school orientation is a rude awakening. With multiple elementary schools feeding into the same building, there can be thousands of students and their families, with few familiar faces. The building is a giant maze, and even the teachers waiting outside their doors to help anxious parents run from room to room are nice, but not particularly welcoming. Kids ranging from 10-14 are thrown together for the first time.

What you don't realize right away is that you may not hear from your child's teachers again during the school year unless something is really wrong. The teacher who called home or emailed when Johnny had a bad day is gone. The burden of making sure your child does well in school and stays there is now squarely on your shoulders.

That loss of control comes at the same time that your child begins to change both physically and emotionally. Middle school students are like roller coaster rides. Your sixth grade daughter still does her homework but forgets to turn it in. Your seventh grader can play video games for hours but won't focus on his schoolwork for more than two minutes at a time.

Your eighth grader is going to parties at houses of people you've never met, and protesting fiercely when you want to call the other

WHAT'S INSIDE:

- A kid just like yours tells her AA story
- Middle school students caught drinking at school
- YouTube and alcohol videos
- Let the data scare you
- Girls start drinking younger than boys
- Schools aren't teaching alcohol and science



parents to introduce yourself. When he gets home, your conversation about the party may begin and end with the question, “What did you do at the party?” to which there is silence or the even more enlightening “Nothing.”

With all of these changes comes the most daunting challenge of all. Suddenly, temptations of the adult world – alcohol, drugs, sex, and much more – are right in front of your children and begging for their attention.

Your child shares little information, and what you manage to find out – primarily from listening to conversations as you drive them from one activity to another – doesn’t tell you enough. Parents are often in the dark about their kids’ drinking and drug use and that of their friends.

Twenty eight percent of 12 to 17 year-olds said alcohol and drug use is their biggest problem. Only 17% of parents list it in their top ten.

LEARNING TO TRUST YOUR CHILD



QUICK FACT

The 11 to 14 year-old is still figuring out who she is and testing boundaries.

In elementary school, parents gain a certain confidence about knowing what their children will and will not do. Johnny would never

disappear without asking. Anne always comes back on time. Middle school challenges all of those assumptions and many more.

“Middle school is a critical time for kids and their parents,” says Rebecca Kullback, of Metropolitan Counseling Associates in Bethesda, MD, a clinical social worker who specializes in working with adolescents and families. “Kids have more independence and form many new relationships with friends and teachers. Parents have to trust that their child has the ability to make safe and good choices.”

Educators describe middle school as the years that count the most. Students are either prepared for high school and the bigger world, or they can be left behind. An award-winning television series from the 1980s, chronicling the life of a boy from middle to high school, described them as “The Wonder Years.” Parents say they are the hardest years yet.

Eleven to 14 year-olds are still figuring out who they are and testing boundaries. She’s argumentative. Her friends know everything, or so it seems. Teachers are suspect. Yet parents, even though their kids are loathe to admit it, still have a lot of influence.

This search for individual identity causes many children to push their parents away. Friends and other adults become preferable sources of information. Parents feel unwanted and unneeded. A lot of fighting and yelling fills the home.

This obnoxious behavior masks a painful self-consciousness. The middle school child wants desperately to be cool and also obsesses about fitting in. If his friends have long hair, he wants long hair. In middle school, it’s all about the here and now.

Peer pressure is fierce. If your child’s friends or kids she wants to be friends with are drinking alcohol or experimenting with drugs or sex, your child may want to do it too. The choices our kids make depend



The vulnerable middle school child

Middle school students are in that rare place where nothing makes sense, and yet they are exposed to many new things. Here's the science behind the developmental changes you will see in your child.

Their Brains – Parts of the adolescent brain are still developing and will continue to do so well into their twenties. Your kids may become:

- Impulsive
- Forgetful
- Argumentative
- Volatile
- Oblivious to consequences

Their Relationships – Children pull away from their parents and look toward others for support. You will see that:

- Their relationships to parents become less important and friends become more
- They look to other adults for support
- They form new friendships and may let others go
- They exclude others from the group

on who they are, how you've raised them, what they know, how confused they are, and many other factors outside of your control.

THIS IS YOUR CHILD'S BRAIN DURING ADOLESCENCE



QUICK FACT

Your child is learning to reason and make informed choices. This shows up in the classroom and at home as questioning.

While researchers once chalked up emotional and behavioral changes to the unknown world of raising a teenager, they now know much of what was considered teen angst comes from hormones and brain changes. The adolescent brain is different than that of an adult. Its prefrontal cortex – right behind the forehead and the part that processes memory, complex thinking, planning, and inhibition – is not yet fully developed and has difficulty processing all the development taking place.

Compare the neurons inside the teen brain to the inside of a kaleidoscope. Masses of neurons are moving and shifting patterns, changing their connections, and causing mood swings and confusion.

Welcome to forgetful, disorganized, self-absorbed, upset, frustrated, yelling, and much more. That's on a good day.

Middle school is also a wonderful developmental time for your child. His brain is learning to process information in new and different ways – he's learning to reason, which shows up in the classroom and at home as questioning.

He can mull over decisions and make informed choices. Elementary school students absorb information as it is presented. In middle school, they begin to evaluate information and choose what to believe. It's the beginning of who they will become as adults.



“In elementary school, kids think if the teacher says it or they read it in a book, it must be right,” says Rebecca Knipp, a sixth grade teacher in Indiana and board member of the National Middle School Association (NMSA). “In middle school, judgment and self-esteem are much more involved in their decision making.”

IS YOUR MIDDLE SCHOOLER DRINKING?



QUICK FACT

Many teens begin with their parents' liquor. Holly took a bottle of whiskey from a small bar in the living room, mixed it with grapefruit juice, and drank all of it.

How do kids this age socialize? They travel in packs. Girls are more interested in boys than boys are in girls. Yet, they are suddenly flung together on team projects, at parties, or in social situations where boys don't completely disappear. So they get to know each other as the years progress.

Eighth grade is the pivotal year. At a middle school retrospective of photographs for Eastern Middle School's Humanities Magnet Program in Silver Spring, MD, sixth and seventh grade girls rarely

took pictures of the boys. By eighth grade, boys were part of almost every shot.

Fitting in and finding friends are the middle school child's whole world. What their friends tell them to do guides their thinking. Friendships also start to shift, and as children become more of the people they will be in high school, they choose the kind of children they'll hang out with for years to come. If that crowd has changed

or is one you don't trust, now is the time to talk with your child and pay attention to where he goes and with whom.

If you think middle school students aren't drinking alcohol, monitor the national news for a few months. While only a small number of incidents are reported to police or covered in the press, alcohol is in many middle schools. Don't expect to hear about drinking problems from school administrators either, unless information leaks out or your child is involved.

GIRLS DRINKING ALCOHOL



Parents of girls should be particularly wary. In the 1960s, only seven percent of girls reported having their first drink between the ages of 10 to 14; now nearly 25% say they do.

Source: National Institute on Drug Abuse

In 2008, some eighth graders brought alcohol into the lunchroom of my son's middle school and I never heard a word from the school about it. How did I find out kids poured vodka and grain alcohol into soda bottles and passed it around at lunch? My son told me. The principal explained the facts of the incident when I called her – how many kids, where it happened, and how she found out. But her answer to additional questions was, "It's being addressed, and I cannot say any more because of privacy issues."

Dare Princess Jumps Off the Bridge

Kat's skin has that peaches and cream glow of youth. Her hair is dark and her eyes sparkle. At 28, she has an air of maturity and self-confidence that makes her seem 10 years older. She is heart-breakingly beautiful.

She tells her story with honesty and directness that comes from having told it before. Her earliest memory of her mother is sitting on the bed with her as she rolled a joint. She was three.

"In fifth grade, I was a DARE princess," she recalls talking about the program in which local police go to elementary, middle, and high schools in their own version of "Scared Straight."

By sixth grade, the DARE princess became dark and angry, she remembers. "When Kurt Cobain died, I started cutting and carved his initials into my arm."

Kat's childhood is a billboard for the role genetics plays in addiction. Her father died of alcoholism when she was very young. Her mother took Kat to AA meetings but never managed to get sober.

For high school, Kat asked her grandparents to send her away to boarding school. She was overweight and painfully self-conscious. School was important to her and she found the curriculum too rigorous for her to drink or do drugs all the time. But on weekends, she picked her friends and parties by whoever was doing them.

Senior year of high school, Kat's mother lost her job for forging prescriptions and filling them at a local pharmacy.



At about the same time, Kat discovered ecstasy, which sent her to a euphoric place where "every human being was beautiful inside and out." Her grandparents gave Kat \$20,000 to pay the rest of her senior year tuition and buy a used car. She spent all of it on drugs.

"When I went home, my mom was doing crack, and having psychotic episodes and I fed her bong hits to calm down," she recalls. "Every kind of insect, mouse, or filth you could imagine was in their house. Eventually I realized that this could be me."

When her mother was functional again, she took Kat to an AA meeting. Kat is now a special education teacher at an acute care unit of a hospital and sober for 10 years. She has a new group of friends, many of whom she met in AA, which provided a community of people like her, struggling with addiction. Her mother died of ovarian cancer while she got clean.



Parents in the dark

A summary of recent research demonstrates why parents should be concerned:

- Alcohol use climbs**
 Sixteen percent of eighth graders, 33% of tenth graders, and 44% of twelfth graders admit to drinking in the last 30 days.
- Number of kids who've been drunk jumps**
 Twenty percent of 14 year-olds say they've been drunk at least once in their lives.
- Bad behavior increases**
 Alcohol plays a large role in many car crashes, suicides, date rapes, family, and school problems.

Tracking reports of middle school drinking for six months in 2009 revealed multiple incidents that made it to online news or were discussed on blogs. Here are a few:

At Gulf Breeze Middle School in Santa Rosa, CA, the 2008-2009 school year ended with four students expelled for possessing and distributing alcohol on school grounds. Eleven students from other middle and high schools in Santa Rosa were expelled that same week for alcohol or drug possession.

At Ponus Ridge Middle School in Norwalk, CT, 22 middle school students were caught consuming alcohol on school grounds. Principal Linda Sumpter said the students included boys and girls from sixth, seventh, and eighth grade. Allegedly, three of the students were selling alcohol they brought from home disguised in iced tea and Gatorade bottles.

At Timberland Middle School in Plaistow, NH, principal Michael Hogan sent a note home to parents telling them only clear bottles could be brought to school. Students were caught with alcohol on school grounds, and because the bottles were colored, they could not immediately tell the kids were drinking alcohol. The police were not called.

At Redland Middle School in Rockville, MD, nine sixth and seventh grade students were disciplined after alcohol was brought into the bleachers before the start of school. Former principal Carol Weiss recommended them for suspension or expulsion.

In Norfolk, VA, three weeks after the death of Taylor Meyer, a 17 year-old Plainville girl who drowned after wandering away from

a teen drinking party, kids drank alcohol like it hadn't happened. Thirty-three teens, most of them schoolmates and neighbors of the deceased girl, were arrested for underage binge drinking at two parties. Parents expected the girl's death would act as a warning to other area teens. Not a chance.

LET THE DATA SCARE YOU



QUICK FACT

Recent estimates are that 20 million adults in the United States abuse alcohol. More than half of them started drinking when they were teenagers.



Temptation is everywhere. Parents keep wine, beer, and hard liquor in their homes. It's open and rarely checked – especially if they are not big drinkers. Family and neighborhood parties have bars. Young teens imitate their parents and pretend to get drunk on Red Bull.

Holly, a middle school science teacher in the Midwest who is now sober, explains how it started for her.

Growing up, alcohol was rarely served in Holly's house. Yet in her early teens, she took a bottle of whiskey from a small bar in the living



room to the basement, mixed it with grapefruit juice, and drank all of it. She doesn't remember much after that.

The first time Holly got drunk at a party, she blacked out and was gang raped. That gasp you hear is other parents reading this book. One of her four brothers is an alcoholic. She found out much later that her grandfather was an alcoholic who drove his car onto her town's railroad tracks, passed out, and got hit by a train.

ALCOHOL IS THE NUMBER ONE TEEN DRUG



Alcohol is by far the most abused drug of the teenage years. In one study, 16% of eighth graders, 33% of tenth graders, and 44% of twelfth graders admitted to drinking in the past 30 days.

Source: National Institute on Drug Abuse

"I drank by myself and at parties," Holly said. "I never knew about the history of alcoholism in our family until I was much older."

Alcoholism runs in families. Almost all of the alcoholics interviewed for this book had a family history of alcoholism.

Drinking young is not necessarily a precursor to alcoholism.

Family, environmental factors, genetic make-up of personality, and

ambition of the child also play a role.

Dr. Sandra A. Brown, a professor of psychiatry and psychology at the University of California in San Diego, says that only half of all children with two alcoholic parents become alcohol dependent at some point in their lives.

Psychologists and researchers who work with alcoholics point out that when it comes to drinking, teens' role models are their parents. If mom comes home at night and immediately mixes a martini or two, or dad puts away a six pack on a Saturday afternoon, kids no-

tice. If there is no designated driver, kids see that. Kids observe their parents from a very young age, and they follow patterns that are familiar to them.

A WORLD INFESTED WITH ALCOHOL

Drinking surrounds kids from the day they're born, points out Ian Newman, director of the Nebraska Prevention Center for Alcohol and Drug Abuse at the University of Nebraska.

"There is no point in sitting children down and talking to them about alcohol in middle school if you are not thinking about the value structure you've created for them at home, both formally and informally, in pre-K and elementary school. Alcohol is a normal part of life for most people, and we must be more aware of how our drinking affects our children," Newman explains.

If you watch *Mad Men*, the AMC program about advertising in the 1960s, children mix their parents' drinks and pick up empty bottles. "It sends the wrong message," explains Dr. Mitch, executive director of C.A.R.E. Florida, a treatment facility in North Palm Beach. "You shouldn't ask your children to get you a beer."

MODELING RESPONSIBLE DRINKING



QUICK FACT

Research found that one in 16 underage drinkers (6.4% or 650,000) were provided with alcoholic beverages by their parents in the past month.

Most of the parents interviewed for this book drink in front of their kids but set limits. A glass of wine or two at dinner, or a beer after work is considered acceptable. Drinking to get drunk is not.



A French-born mother of an eighth grade girl and two younger kids explains that while she does not permit her children to drink wine in the United States, she does when they visit grandparents in France. “We try to follow the customs of the country we’re in,” she says.

Permitting kids to sip alcohol, which many parents hope will remove the forbidden fruit aspect of the experience, doesn’t appear to encourage drinking. Nearly 40% of children ages eight to 10 have sipped or tasted alcohol, according to a recent study. The study found that children who had tasted alcohol were not more likely to abuse it or drink on a regular basis.

Some parents also believe that letting a teen drink with friends in the privacy of their home is better than letting them get behind the wheel of a car. More than 40% of the nation’s estimated 10.8 million underage current drinkers (persons ages 12 to 20 who drank in the past 30 days) were provided free alcohol by adults 21 or older. But parents are liable if teens drink in their homes, and this choice should be weighed carefully against potential legal consequences.

Experts say the conversation about alcohol should start as early as fourth grade and continue through middle and high school. The



middle school years are critical because pre-teens still rely on their parents and want their attention. When they get hurt, they want their mothers. When they are sad or confused, they will talk about it. Maybe not the first time they are asked, but eventually. Even though parents aren’t always acknowledged, when you talk to your kids, they still listen.

Science provides a good alternative to just say no. It answers the question, “Why should I listen to you?” And it can help your teen understand that alcohol:

- Affects every organ in the body by traveling through the bloodstream
- Varies in effect depending on weight, amount of food consumed, how much is consumed, and what it is mixed with
- Can hurt their sports and school performance
- Can make people do things they ordinarily would not do, such as have sex or take other risks



SEDUCTION BY ADVERTISING



QUICK FACT

A study of adolescents in 63 Chicago schools found 931 ads related to alcohol in a two-block radius displayed on storefronts, billboards, bus backs, and other spots in the neighborhood.

A mother of a 12 year-old and two elementary school kids recalls, “I handed my kindergartener a bottle of grape juice, she put it to her lips, and called out ‘Cheers’ then drank it. This is what they see on television.”

Many parents become less vigilant about monitoring Internet usage, television viewership, and where their children go, as they move through middle school. But you should still check the sites they visit and what they are watching. A recent YouTube search found more than 300,000 videos dealing with alcohol use. The music adolescents listen to is filled with alcohol, drug, and sexual references, often glorifying all of them.

“Kids are literally bombarded by beer commercials on TV and by characters in prime-time TV shows who are drinking. Half of all



animated kids' films show characters drinking alcohol ... usually without any negative consequences like bar fights, unwanted or unintended sexual experiences, or car crashes," explains John Donovan, associate professor of psychiatry and epidemiology at the University of Pittsburgh Medical Center.

Inner-city neighborhoods are filled with images of people drinking. A study of adolescents in 63 Chicago schools found 931 ads related to alcohol in a two-block radius displayed on storefronts, billboards, bus backs, and other spots in the neighborhood.

Teens can also buy beer, wine or liquor, and prescription drugs on the Internet, studies show. Regulators who enforce strict laws designed to prevent alcohol sales to underage teens in retail stores don't police Internet sites often or well.

On some Web sites, underage purchasers need only to click on a statement saying they're at least age 21 to set the wheels in motion. Shipments arrive, no questions asked. Other sites require that customers present proof of age.

A recent study was conducted by TRU (formerly Teen Research Unlimited) in Chicago, IL, on behalf of the Wine and Spirits Wholesalers of America (so take into account that the results may be self-serving). It found that two percent of 14 to 20 year-olds have purchased alcohol online. Twelve percent reported having a friend who had ordered alcohol online. Forty percent know it's available online. Simply put: If your teen wants to buy alcohol or drugs online, it's not hard to do.

YOUTUBE AND ALCOHOL - AUGUST 2010

Kids of all ages are searching YouTube. These results are a mix of pro- and anti-alcohol viewpoints.

Total YouTube videos on alcohol – 300,000

Cool alcohol drinks – 5,100

Drinking alcohol – 5,070

Alcohol and parties – 1,390

Sex and alcohol – 5,120

Marijuana and alcohol – 4,580



How to Save a Life

With his Beverly Hills 90210 looks, Sandy could be the boy next door, your brother, best friend, or the hottie sitting next to your daughter in science.

He had loving parents and a younger sister. His family struggled to send him to private school and was able to up until high school.

He was a quiet boy, smart, and reasonably popular. He fit in well in private school; everyone knew each other and most people in his grade were friends. He graduated middle school with 21 other students.

But on his first day in a public high school with 900 students, Sandy felt left out. He became an introvert. He hid his confusion and frustration behind alcohol and drugs.

“I had an instant physical response with alcohol,” he remembers. “My extrovert came out – and I felt like I’d come into my natural self, free of all self-criticism and fear,” he says.

Both Sandy’s parents were recovering alcoholics who worked in the drug and alcohol treatment profession. They knew how vulnerable he was.

Sandy made only two friends his freshman year with theater kids who also operated on the fringes of the school. He followed them to a magnet program for performing arts at another high school the following year. Many of the artsy kids were into drugs, and Sandy had access to cocaine, ecstasy, tranquilizers, and more.

The first time Sandy came home high, his family went to a counselor and made him take random drug tests. He was given more chances



to stop drinking and taking drugs because his grades were still good. When Sandy’s grades slipped, a dark car with a uniformed driver and highly polished chrome came to the door.

The driver took Sandy to a Wilderness Treatment Center in a remote part of Wyoming. He spent several days alone and was told to think about what he was doing.

“I hated it and got into conflicts with the staff,” Sandy says of the treatment program. “But I came home five months later and haven’t had a drink or taken a drug since.”

About halfway through a master’s in public health, Sandy quit smoking, his last vice. He offers a wide boyish grin and goes back to a three-day AA meeting to celebrate the sobriety of youth.

HIGH-RISK ADOLESCENTS



QUICK FACT

It takes a long time to become an alcoholic, some studies show. In families with alcoholism you cannot start talking to your children early enough.

Studies show that adolescents who start drinking before age 15 are five times more likely to have alcohol-related problems later in life. So, convincing your kids to delay that first drink can make a big difference to the rest of their lives.

Parents of girls should be particularly wary. In the 1960s, only seven percent of girls reported having their first drink between the ages of 10 to 14; now nearly 25% say they do. And the younger a girl is when she reaches puberty, the more likely substance abuse will occur earlier in her life.

Kids with major family problems are also at high risk to drink young. A survey of nearly 3,600 Americans ages 18 to 39 found that kids, who experienced physical or sexual abuse, lived with a mentally ill fam-

ily member, had substance abuse in their home, or had parents who went through a divorce or separation, were more likely to begin drinking before age 15.

KIDS WHO STAY OUT LATE DRINK MORE



A recent survey of more than a 1,000 12 to 17 year-olds and 300 parents, found that 50% of kids who come home after 10:00 p.m. said that drinking alcohol, smoking marijuana, or using other drugs occurs while they are out on school nights. Only 29% of those who came home earlier said the same thing.

Source: CASA Columbia

The most vulnerable teens have family problems and a genetic predisposition to alcoholism, says Tammy L. Hughes, Ph.D., an associate professor of school psychology at Duquesne University. She points out that poverty, availability of drugs in the community, and low attachment to school and communities are also major risk factors.

Older brothers and sisters can also affect younger siblings' drinking and drug use. One father of 11 and 14 year-old girls recalls drinking from a jug of cheap wine at age 10 in a backyard tent with his older brothers.

Many children today are much more aware than past generations of the toll alcohol abuse can take. One parent remembers while growing up there were blazing signs that some of her friends' parents had drinking problems. One mother lay in bed with a vodka bottle next to her, another slurred her words and cried over a lost child. But alcoholism was never discussed, and she didn't process that it was right in front of her.

"It takes a long time to become an alcoholic," says Dr. Harold Urschel III, head of the Urschel Recovery Science Institute in North Palm Beach, FL. "In families with alcoholism, you cannot start talking to your kids early enough. Don't scare them but be honest. Tell them grandma had this problem, and she got really sick. Treat alcoholism as an illness just like cancer and high blood pressure."



WHEN KIDS PULL AWAY



QUICK FACT

In most school districts, information about alcohol is taught as part of a larger curriculum dealing with sex, drugs, and sexually transmitted diseases (STDs). Lumped in with a host of other things they shouldn't do, students tune out.

As your middle school kids become more mature, it's tempting to push back and leave them alone. But these are the years where they need you more than ever before.

Vigilance is critical as kids test limits. Alcohol and drugs pervade the teen world. And if they decide to drink, they will face choices about when, where, with whom, and how much they should consume. The choice to drink will come up. What matters is what your child does about it and the role you play in ensuring he or she makes wise choices.

Newfound freedom for middle school kids raises other issues for parents. You no longer take them everywhere and supervise their



activities. They are dropped at the movies and picked up afterward. They are driven to the mall and allowed to wander or shop on their own, as long as they meet up at an appointed time. They are left

alone at home or watched by older siblings, who may not pay much attention to them.

A recent Brigham Young University study found that parenting style directly affects teens when it comes to heavy drinking (five or more drinks in a row). Researchers surveyed nearly 5,000 adolescents between the ages of 12 and 19 and assessed parents on accountability (keeping tabs on their kids and sticking with curfews, etc.) and warmth (approachability and loving attitude).



They found that:

- Parents who focused on accountability and warmth were least likely to have adolescents who drank heavily.
- Parents who were low on accountability but still high on warmth, tripled the risk of their teens drinking heavily.
- Parents who were high on accountability and low on warmth doubled their teen's risk.

DON'T COUNT ON THE SCHOOLS FOR ALCOHOL EDUCATION

Try talking to a middle school student about almost anything and the response is the standard, "Mom, I know that." Parents assume that school health classes focus on alcohol and provide information about the science and dangers of it. But in most school districts, in-

formation about alcohol is taught as part of a larger curriculum dealing with sex, drugs, and sexually transmitted diseases (STDs), and it receives minimal attention. Lumped in with a host of other things they shouldn't do, students tune out.

"It's much more rigid than when you and I were in middle school," explains Cara LeGrys, the Career and Technical Education Supervisor for Loudoun County Public Schools in Virginia. "Students must pass end of course tests that count toward graduation, show how the school is performing, and meet the requirements of the No Child Left Behind program."

Yet some of the pressure from school contributes to alcohol use. A recent study of 6,500 teens found that 73% said school stress caused them to drink and take drugs.

When schools concentrate on risky behaviors, especially starting in elementary school, they can have a powerful influence. As one parent put it, "My child thinks if you smoke cigarettes you will die. If they could be as successful in teaching about the effects of alcohol, it would delay that first drink for a long time."

Parents say they receive almost no information from middle schools about alcohol education. This may also reflect, at least in part, that middle school kids are notorious for losing hand-outs.

Although parents have the option of keeping kids out of sex education classes, alcohol and drugs are not considered as sensitive. Schools often permit parents to come in and review what is taught in health classes. All it takes is a phone call or e-mail request.



The Science Inside Alcohol

As it travels through the body in the bloodstream, alcohol comes in contact with almost every major organ. This scientific fact may come as a surprise to teens that tend to think of alcohol as something they digest. The body processes alcohol differently than other foods and liquids.

Explaining the science of alcohol to adolescents provides parents with another tool for talking to their kids about alcohol – one that hopefully defies argument. This section provides information on what alcohol is and how it affects teens and adults physically and mentally.

It's meant to be used as a companion piece to a series of Science Inside Alcohol lessons that AAAS has developed (www.scientificalinks.com) or as a stand-alone that can help you work with your child at your own pace. An e-book for students will also be available online soon.

Much of the information in this section demonstrates how the body functions as a coherent system, the way a computer does, and how if one part has a problem, the rest can suffer as well.

Our hope is that parents will use what they learn, not in a preachy way, but to begin educated discussions on why it's better for adolescents to delay their first drink until they are older.

The section is divided into teachable chunks explaining each body system that alcohol affects. Some of the information, particularly the section on alcohol and the brain, is based on new research led by neuroscientists. Much of the rest is based on decades of experiments and testing, with each project building upon the knowledge accumulated earlier.

Background information on the type of science discussed is provided, as well as information on each body system and its function, organs, and how alcohol affects it.

WHAT'S INSIDE:

- Body systems and how alcohol affects them
- Why the teen brain can't handle alcohol
- Blood alcohol content defined and explained
- Why drinking and driving is a bad idea
- What the consequences of heavy drinking can be

Potential effects of heavy drinking

Alcohol Poisoning

This happens when large amounts of alcohol are consumed in a very short period of time. Body systems begin to break down, immediate medical care is needed, and if not treated, it can be fatal. People who survive may have irreversible brain damage.

Drunk Driving

It's estimated that more than 1,500 college students die each year from unintentional alcohol-related injuries, including car crashes, according to Mothers Against Drunk Driving (MADD).

Blackouts

In one study, 27% of students reported at least one incident of forgetting who they were with or where they were while drinking.

Take time to explain the Science Inside Alcohol, letting your child absorb what she learns as she goes, reviewing the material with her, and then moving on to a different part of the section.

WHAT IS THE CHEMISTRY OF ALCOHOL?



QUICK FACT

Alcohol is a psychoactive drug that alters brain function.

Ethyl alcohol or ethanol (which will now be referred to as alcohol) is a psychoactive drug, meaning that it's a chemical which alters brain function causing temporary changes in behavior, mood, and perception, among other things. Ethyl alcohol is found in alcohol that we drink and is also produced naturally within our bodies.

Most alcoholic beverages come from the fermentation of grapes, grains, and potatoes. Fermentation is the process through which carbohydrates such as sugar are turned into alcohol.

Alcohol is composed of carbon, hydrogen, and oxygen. Because of this combination, it is considered an "organic" chemical. In wine, for example, fermentation occurs when yeast interacts with sugars in the juice from grapes and creates ethanol.

Alcohol mixes with water, which is how you measure the proof or percentage of alcohol in wine, beer, or other beverages.

Proof is the commonly used measure of how much alcohol is in an alcoholic drink. You take the percentage of alcohol in a drink and double it to get the proof measurement. The amount of alcohol in a bottle is regulated by law and taxes.

Proof is one of those holdover terms, the ones that stay despite long gone origins. In the 18th century and up until about 30 years ago, Britain defined alcohol content in terms of “proof spirit.” The British term started when payments to British sailors included rations of rum. To save money, the rum would be watered down and the alcohol content could be very low.

So the sailors would toss gunpowder into the rum to see if it would light on fire. If there wasn’t enough alcohol, it didn’t burn and was considered to be “under-proof.”

Different types of alcohol have different proof levels in part because of what they’re made from. Here’s some more information:

Beer – The alcohol content of beer in the U.S. is usually 3-6%. Grains, malts, and lager beers can have higher alcohol content. Beer is made from grains, malt, hops, yeast, and water. Beer is just empty calories.

Wine – American wine is 9-14% alcohol. Fortified wines have an alcohol content higher than 14%. These wines contain added alcohol or brandy to increase the alcohol content to approximately 20%. Wine is made from fruits, most likely grapes, berries, or peaches and often has crushed yeast added to it.

Hard Liquor – The alcohol content can be 14-40% in distilled spirits. The distillation process includes heating substances and capturing the steam released. When cooled, the steam contains more alcohol than water. Some of the products used to make liquor are corn (bourbon), potatoes (vodka), sugar cane (rum), and malts/grains (scotch).



The morning after

Drinking too much alcohol can cause hangovers. A single alcoholic drink is enough to trigger a hangover for some people. In general, over three to five alcoholic drinks for a woman and over five to six for a man will usually result in a hangover. About 75% of people who drink until they are drunk will have a hangover the next day.

Several conditions can accompany a hangover, including:

- **Dehydration** as the body produces more urine than usual leading to thirst, dizziness and lightheadedness
- **Nausea** or vomiting that can lead to stomach upset
- **Headaches** caused by blood vessel expansion
- **Sleepiness** due to narcotic effects that can cause grogginess and fatigue

YOUR BODY SYSTEMS AND ALCOHOL



QUICK FACT

If a boy and girl of equal weight drink the same amount of alcohol, she will likely feel its effects more strongly than he will.

The human body is made up of multiple systems all working together and supporting each other. Compare your body to the motherboard of a computer. The processor, memory cards, storage drive connectors, CPU, memory sockets, and everything else that supports the operation of your computer is attached to the motherboard.

You cannot understand how a computer works just by listing its parts. The connections and processes must be understood to determine what makes the computer work. The same is true of the human body.

The major body systems affected by alcohol are the digestive, central nervous, cardiovascular, and endocrine systems. When an outside chemical like alcohol is introduced into the body, it affects parts of these systems and different organs within them in different ways.

Alcohol is diluted in the water volume of the body to travel through its systems. Vital organs such as the brain, that contain a lot of water and need an ample blood supply, tend to be more vulnerable to the effects of alcohol.

The brain, liver, heart, pancreas, lungs, kidneys, and every other organ and tissue system are affected by alcohol within minutes after it passes into the blood stream. A drink's strength will affect absorption rates in the body. Higher concentrations of alcohol are absorbed more quickly. For example, a shot of hard liquor such as vodka or tequila is generally absorbed faster than mixed drinks, which are absorbed faster than wine or beer. However, standard drinks of alcohol (five ounces of wine, 12 ounces of beer or 1.5 ounces of distilled spirits) all contain the same amount of alcohol.

Alcohol can also fool the body. For instance, drinking it may feel warming at first, but it eventually causes you to feel colder by increasing perspiration and body heat loss. It can reduce body levels of Vitamins B1, B2, B6, B12, C, folic acid, zinc, magnesium (the anti-stress mineral), and potassium, which are essential for muscle contraction and relaxation, as well as normal heart rhythms.

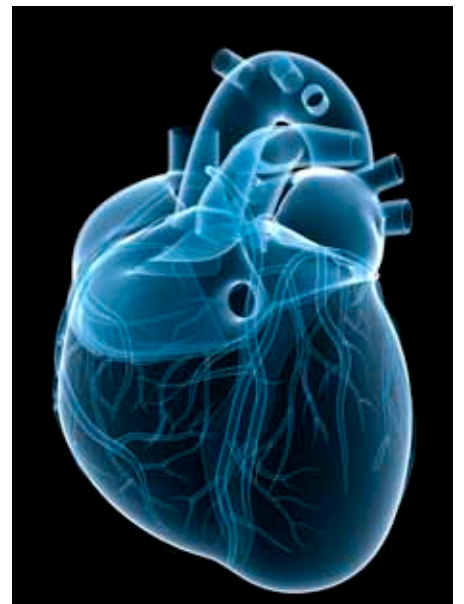
The most damage to body systems from alcohol comes from chronic long-term abuse of it. Heavy drinking can lead to high blood pressure and increase the risk of heart attack or stroke, liver disease, and a variety of other serious illnesses.

Parents should be particularly watchful of middle school students who don't know much about alcohol and how it affects their bodies' systems. Young teens and college students are most likely to drink too much because many are first-time or inexperienced drinkers. As a result, they're particularly vulnerable to the effects of alcohol.



Women are affected by alcohol more rapidly because they tend to have a higher proportion of body fat than men. As fat cannot absorb alcohol, it is concentrated at higher levels in the blood. Women also have less of a gastric or stomach enzyme (dehydrogenases) that metabolizes or breaks down alcohol before it enters the bloodstream. Because of this, women absorb up to nearly 30% more alcohol into their bloodstream than men of the same height and weight who drink the same amount of alcohol.

When women of average size consume one drink it has the same effect as two drinks do for the average-size man. If women eat little or skip food entirely, the alcohol will have even greater effect on them. Hormone changes during menstruation can also affect how women metabolize alcohol, increasing its effects.



THE DIGESTIVE SYSTEM



QUICK FACT

About 20% of alcohol consumed is absorbed by the stomach and 80% is absorbed in the small intestine.

How Heavy Drinking Can Harm the Digestive System

The major organ that processes alcohol is the liver. Long-term alcoholism can cause a disease called cirrhosis of the liver which kills about 26,000 people each year.

The digestive system allows you to digest or break down foods. Its organs include the mouth, esophagus, stomach, small intestine, large intestine (also called the colon), rectum, and anus. The mouth, stomach, and small intestine mucosa (the innermost layer of the gastrointestinal tract), contain tiny glands that produce juices to help digest food. The liver and pancreas also produce digestive juices that reach the intestine and aid digestion.

Alcohol is not digested like other foods. Alcohol passes from the mouth, down the esophagus, into the stomach, and then into the small intestine.

More than 90% of alcohol that enters the body is oxidized to acetic acid primarily in the liver. The remaining alcohol is excreted in sweat, urine, or given off in one's breath, which is why you can smell it on someone who has been drinking, even the next morning.

Alcohol is diluted in the water volume of the body to travel through the system. Vital organs, like the brain, that contain a lot of water and need an ample blood supply, are particularly susceptible to the effects of alcohol. The body dilutes alcohol and limits its effect.

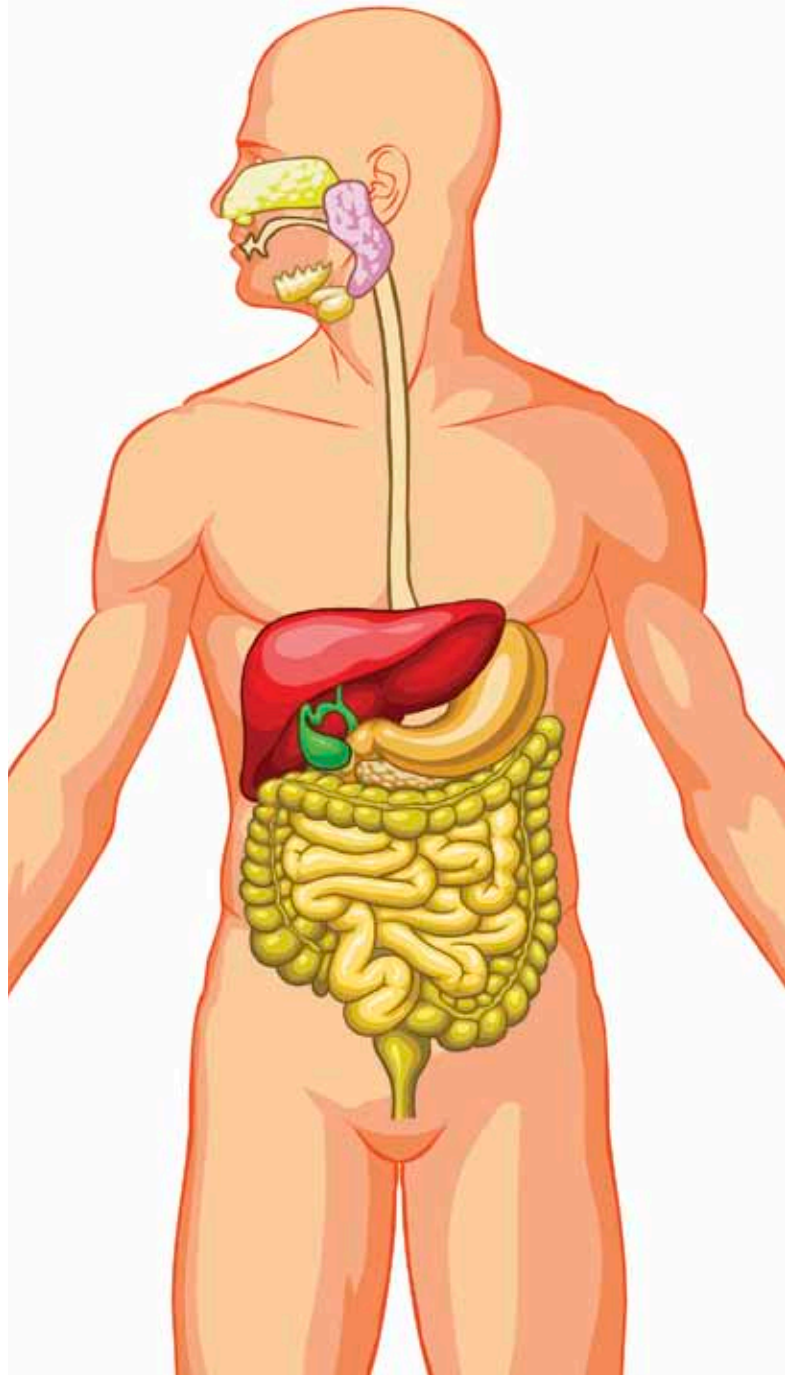
Almost 200 years ago, scientists learned that heavy drinking caused liver disease. Since the liver is the main part of the body that processes alcohol, it is not surprising that it is particularly susceptible to alcohol-related injury. The liver is the largest organ in the body, weighing more than three pounds. Without it, you

could not live. The liver's job is to get rid of toxins, regulate blood sugar levels, and produce bile.

This reaction can result in a disease called cirrhosis of the liver. Cirrhosis occurs when scar tissue replaces normal, healthy tissue, blocking the flow of blood through the liver and preventing it from working as it should. Cirrhosis kills about 26,000 people each year.

The stomach, the small and large intestines, and the pancreas are also affected by alcohol. Alcohol increases acid in the stomach, which can result in gastritis (severe gas pain) or stomach or intestinal ulcers. Food affects alcohol absorption into the bloodstream and can slow it down.

Other substances like marijuana, sleeping pills, or sedatives combined with alcohol increase the danger of overdose. For example, perhaps the most dangerous combination is mixing sedatives, which depress the central nervous system (CNS), with alcohol. This combination can lead to extreme depression of the CNS and may be fatal.



THE CENTRAL NERVOUS SYSTEM (CNS)

How Heavy Drinking Can Harm the CNS

Alcohol is a CNS depressant, which means it slows the CNS down and can cause delayed reaction time. This effect is more prominent in adults than teens.



QUICK FACT

Alcohol is a depressant that slows down brain activity, delays reaction time, and impairs vision and memory.

The nervous system is composed of a network of neurons, glial cells, and other supportive cells. Neurons are nerve cells that transmit signals to and from the brain at up to 200 mph. They form functional circuits, each responsible for specific tasks.

Glial cells, which are star-shaped and comprise 90% of the brain's cells, help neurons by providing physical and nutritional support, digesting parts of dead neurons, and manufacturing myelin for them, among other tasks. Myelin is a protective coating of the path (axons) through which neurons travel. It also enables nerves to conduct impulses between the brain and other parts of the body.

The nervous system consists of two main parts. The central nervous system is made up of the brain and spinal cord. The peripheral nervous system includes the nerves that serve the neck and arms, chest, legs, skeletal muscles, and internal organs.

Before multiple painkillers were invented, alcohol was sometimes used to dull pain and sterilize wounds before and after surgery. People have a higher tolerance for pain as more alcohol enters the bloodstream.

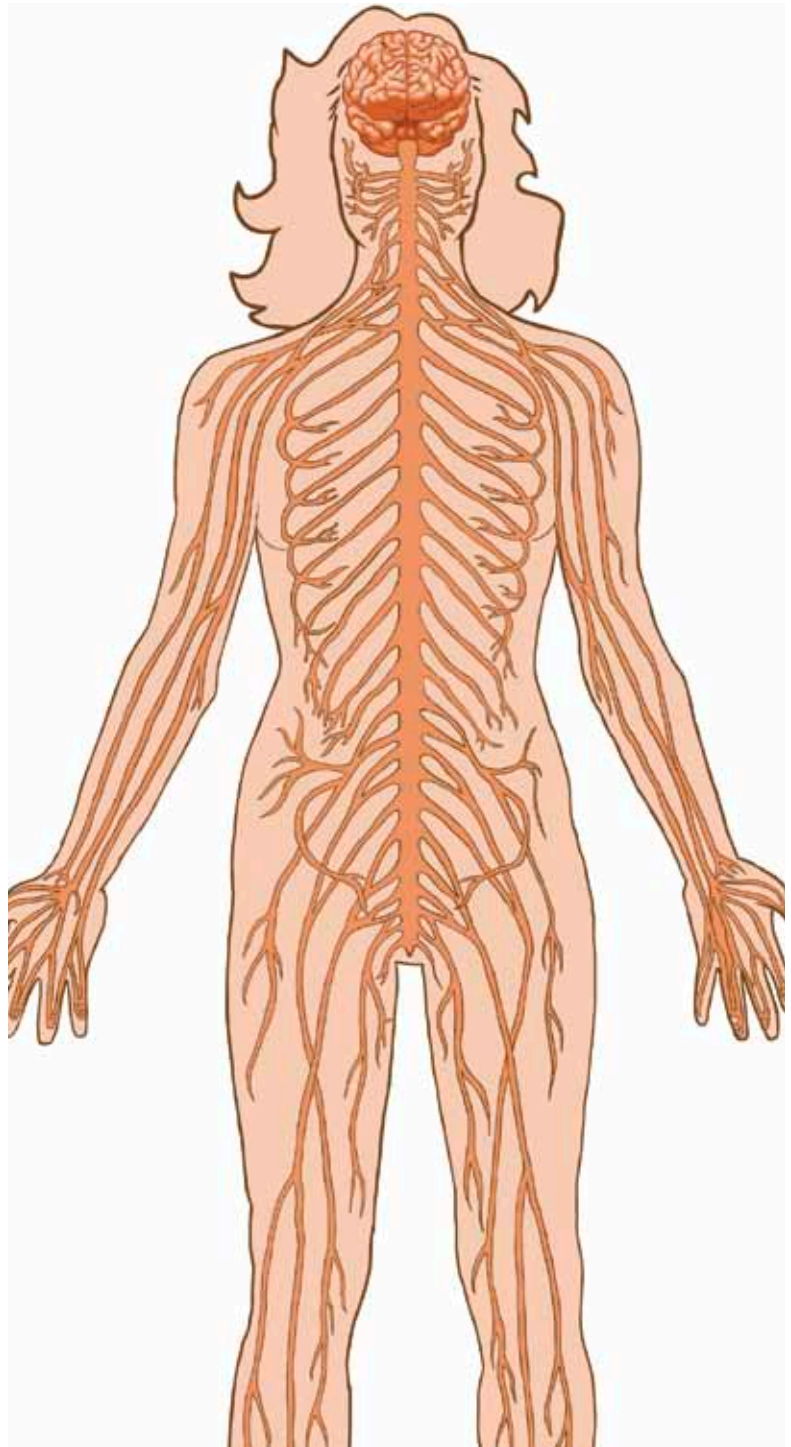
Alcohol is a CNS depressant, which means it slows activity down. This is deceptive, because when you first start drinking, alcohol can seem like a pick-me-up, making you



more animated and causing a loss of inhibition. How much brain activity slows depends upon how much and how fast a person drinks. Some results are slurred speech, hazy thinking, slowed reaction time, dulled hearing, impaired vision, weakened muscles, and fogged memory.

The effects of alcohol on the CNS are temporary and vary depending upon:

- The amount of alcohol consumed
- The time period over which alcohol is drunk
- Whether alcohol is combined with other drugs
- Genetic background such as ethnicity and sex
- Mood and psychological makeup
- The environment in which alcohol is consumed
- Size, weight, and sex of the person
- Whether it is consumed with food
- Underlying physical conditions or illnesses



THE BRAIN



QUICK FACT

Scientists now know that many characteristics of adolescence, such as mood swings and impulsive behavior, are partially a result of ongoing brain development.

How Heavy Drinking Can Harm the Brain

Teen brains are not fully developed, and alcohol abuse can harm the parts that are not completely finished, causing memory loss, reckless and impulsive behavior, and surges of emotion.

The brain is made up of more than 100 billion neurons, each making tens of thousands of connections. Heavy consumption of alcohol, particularly over long periods of time, can damage or even kill neurons, potentially altering development of parts of the adolescent brain that are still forming.

Alcohol crosses the blood brain barrier, moving from its circulation in the blood into the brain cells. This is where the statement “alcohol kills brain cells” comes from. But it’s simply not true. The early temperance writers made this assertion and also insisted that the alcohol in their blood could cause “drunkards” to catch fire and burn alive. This notion was dropped long ago, but many anti-alcohol writers continue to promote the idea that even moderate drinking causes brain cells to die.

Medical research has actually demonstrated that the moderate consumption of alcohol among adults is associated with better cognitive (thinking and reasoning) skills and memory than is abstaining from alcohol. Moderate drinking doesn’t kill brain cells but helps the brain function better into old age. Studies around the world involving many thousands of people report this finding.

Of course, years of alcohol abuse can cause serious neurological damage. Scientists once thought most of the brain’s development was confined to the first few years of life. But current research shows that important brain regions undergo refinement through adolescence and at least into a person’s twenties. Through advanced brain imaging techniques, scientists now can map brain tissue growth spurts

and losses, allowing researchers to compare brain growth in both health and disease and to pinpoint at what stages in life the brain changes. This also helps them examine the brains of alcoholics, moderate drinkers, and those who don't drink at all.

How Our Brains Develop

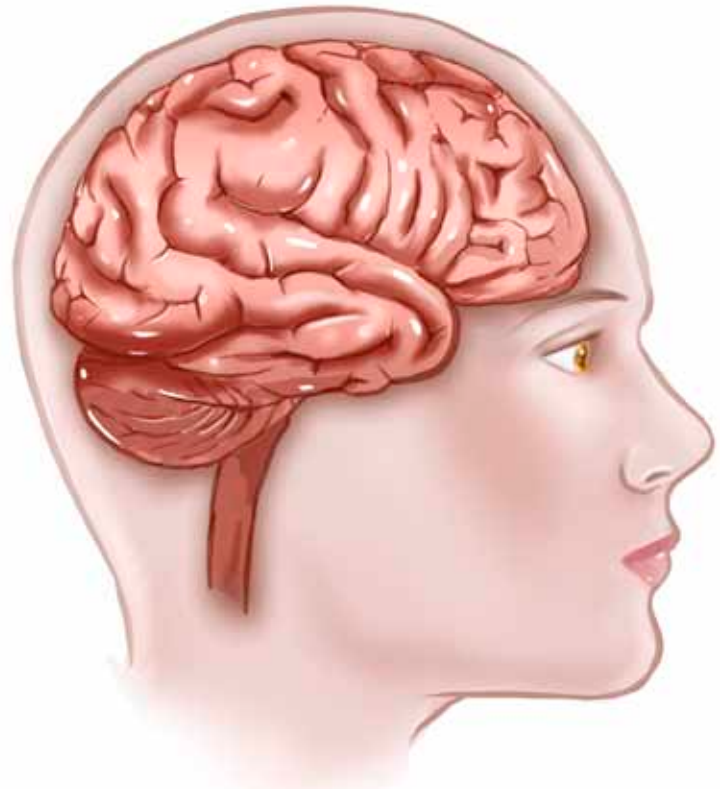
Babies are born with far more neurons than are present in the adult brain, with many of those extra neurons lost over the first few years. The selection process that determines whether an individual neuron lives or dies is called pruning. Gray matter (which is composed of neurons and their connections) increases in volume at earlier ages and starts thinning around puberty, as the brain gets closer to its adult state. Thus, it appears that adolescent brain development, at least in the frontal lobes, is in a unique stage of change.

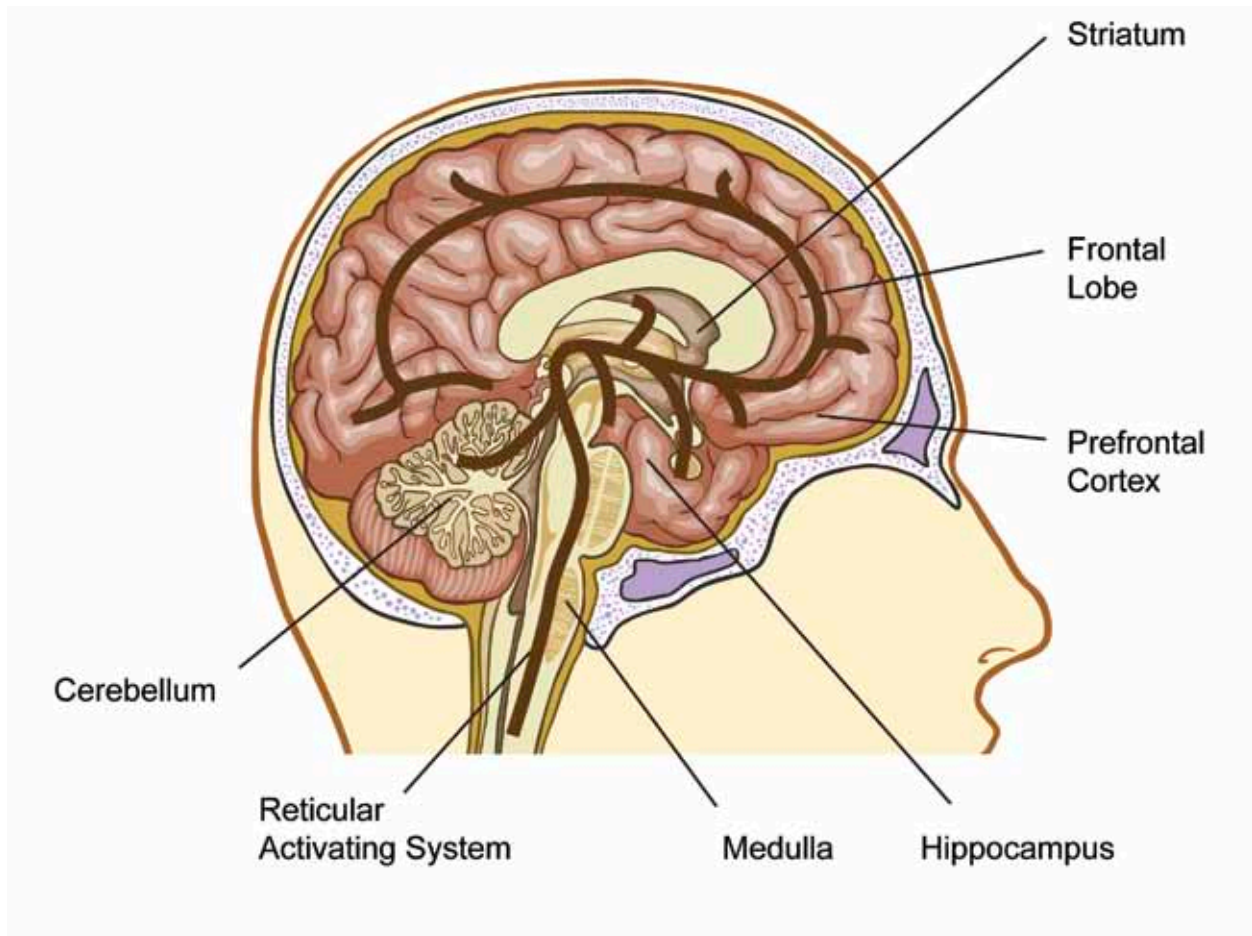
Scientists now know that many characteristics of adolescence, such as mood swings and changes in behavior, are partially a result of ongoing brain development. Parts of the brain that help teens coordinate behavior, make decisions, and control their impulses are still forming. As a result, an adolescent's brain may be highly malleable by experience, whereas an adult's usually is not.

This is Your Teen's Brain on Alcohol

Alcohol can affect development of vital brain parts or how they function. Under the influence, teens can:

Make bad decisions. The prefrontal cortex, which is involved in planning and decision-making, does not completely mature until after the teen years. Using alcohol can harm a teen's ability to reason and weigh options, instead of just doing something because it is fun or feels good. Drinking as a teen may also alter the pre-frontal cortex permanently.





Develop a tolerance for alcohol and drink more over time. When people drink for many years, their brains develop tolerance for alcohol, requiring more alcohol to obtain the same effects as before.

Take risks they ordinarily would not take. Connections between regions of the prefrontal cortex and the ventral striatum, an important part of the brain's reward system, help regulate impulsive behavior and are still maturing during adolescence. Alcohol can affect those connections, making teens more likely to do impulsive things such as drinking and driving.

Harm their memories. The hippocampus, or the area in the brain that helps store memory, is still maturing during adolescence. Research shows that ingesting even small amounts of alcohol can make teens less likely to recall something they learned earlier or remember what they did while drinking.

Cause problems with medications. Medication for attention deficit disorder, bipolar disorder, or other brain-related illnesses may react badly with alcohol. Alcohol increases the hepatic enzymes in the liver so it actually breaks down drugs more quickly, making them less effective. For instance, if a teen takes Ritalin and drinks alcohol, it may increase the effects of the alcohol, damaging his ability to perform tasks that require complete concentration. Teens who take lithium for bipolar disorder may have impaired judgment, thinking, and motor skills.

Why People Fall Asleep at the Wheel

Drinking alcohol can harm a teen's ability to reason and weigh options instead of just doing something because it is fun or feels good.

The cerebellum works with the primary motor cortex to control movement, balance, and complex motor function. Drinking alcohol can decrease motor function and slow reaction time. When drunk, you may not be able to stand or walk a straight line.

The frontal lobe controls judgment, behavior, and emotion. Alcohol may change your emotions leading to crying, fighting, or a desire to be close to someone else.

The medulla controls heartbeats, breathing, and other functions. These may slow or stop working during heavy drinking, endangering your life.

The reticular activating system controls sleeping and waking. Alcohol abuse can depress these systems, causing you to pass out.

Neurons connect nerve cells in different parts of the brain. Alcohol is a depressant that slows those connections.

Blood vessels in your brain can swell when you've been drinking, causing pressure that results in severe headaches.



THE CARDIOVASCULAR SYSTEM



QUICK FACT

Heavy drinking can cause cell death which shows up as broken capillaries, red eyes in the morning, or the red, blotchy skin often seen on a heavy drinker's face.

How Heavy Drinking Can Harm the Cardiovascular System

Large quantities of alcohol can modify the signals that regulate heart function and restrict blood flow to other organs.

Within the cardiovascular system, the heart pumps blood, which is channeled through vessels linked throughout the body. Electrical and chemical signals to the heart cause blood to pump into the arteries. Your pulse is caused by the pumping of blood.

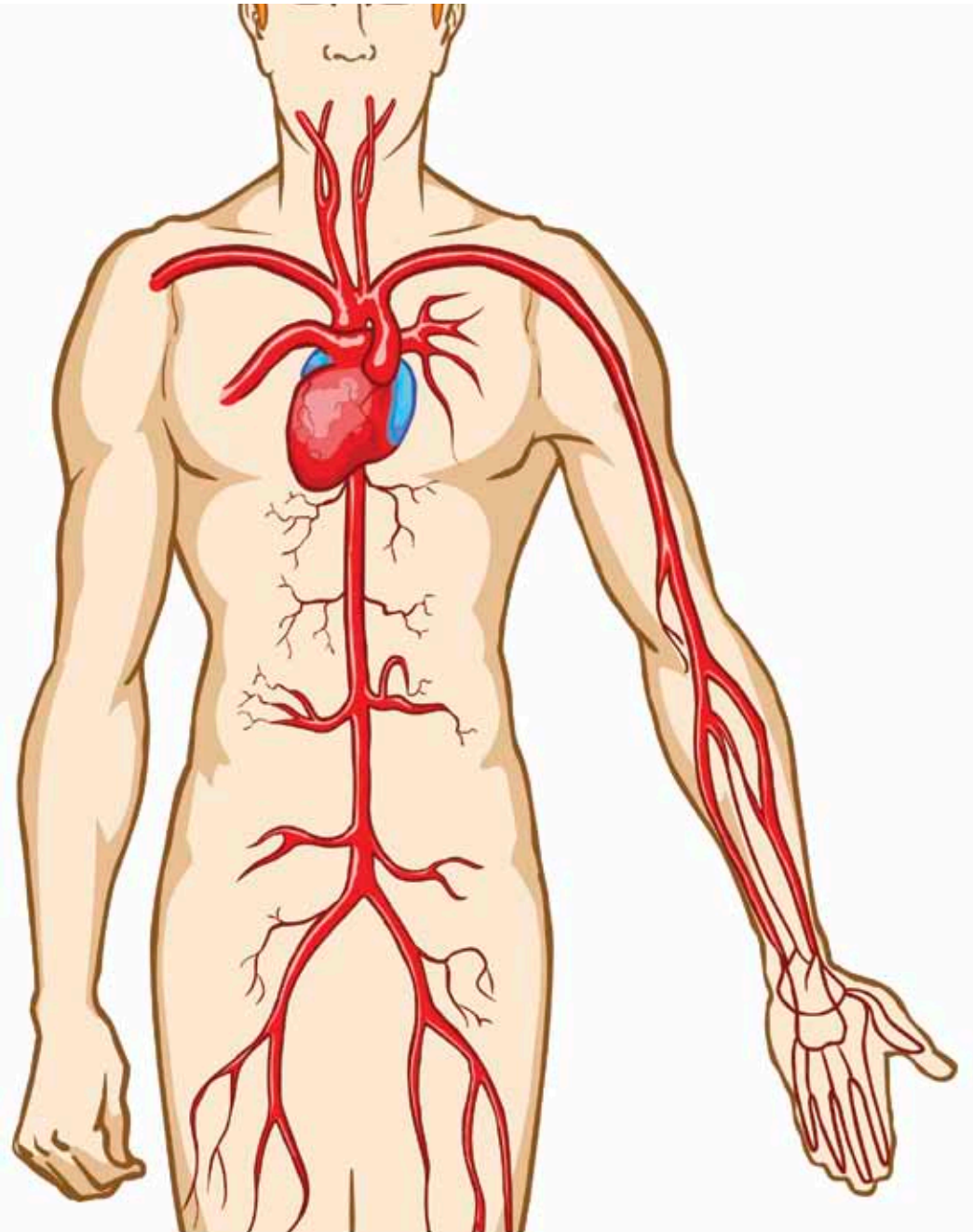
Scientists say that alcohol may have both positive and negative effects on the cardiovascular system. Studies have shown that drinking in moderation can help heart function and lower the risk of heart disease and heart problems.

Alcohol can improve cardiovascular function by modulating or changing the concentrations of high density (HDL) and low density (LDL) lipoproteins which affect cholesterol levels. Alcohol can also improve cholesterol by reducing blood clotting or thrombosis (the formation or presence of a blood clot in a blood vessel including veins and arteries), coronary artery spasms in response to stress, blood pressure, and plaque in the arteries.

The good news is daily low or moderate consumption of alcohol in adults helps to maintain the right level of lipoproteins and can even lead to a longer life.

The bad news is that drinking alcohol can cause harm. Alcohol can modify the signals that regulate heart function, restricting blood flow to other organs. This robs them of nutrients such as oxygen. If the drinker already has restricted or clogged arteries, veins, or capillaries, the heart must over-perform to compensate, and damage can result.

Another effect of drinking alcohol is “blood-sludging,” in which the red blood cells clump together causing small blood vessels to plug up, starving the tissues of oxygen and causing cell death. Cell death can take the form of broken capillaries, red eyes in the morning, or the red, blotchy skin seen on an alcoholic’s face. Blood vessels can also break in the stomach and esophagus, leading to hemorrhage and even death.



How Alcohol Harms the Endocrine System

Diabetics who drink can lower their blood sugar and increase the amount of insulin produced. Severe low blood sugar can cause passing out, seizures, and even death.

THE ENDOCRINE SYSTEM



QUICK FACT

Men or boys who drink heavily are at risk for erectile dysfunction and emotional changes because alcohol affects hormone production and release.

The endocrine system helps regulate growth, puberty, metabolism, tissue function, and mood through hormones. Each hormone is secreted from a particular gland and distributed throughout the body to act on tissues at different sites. Two areas of the brain, the hypothalamus and the pituitary, release hormones, as do glands in other parts of the body such as the thyroid and pancreas.

Hormones control five major areas of body function:

1. Production, utilization, and storage of energy
2. Reproduction or the creation of new life
3. Maintenance of body systems regulating blood pressure and bone mass
4. Growth and development, or how we mature as we age
5. Management of stress.

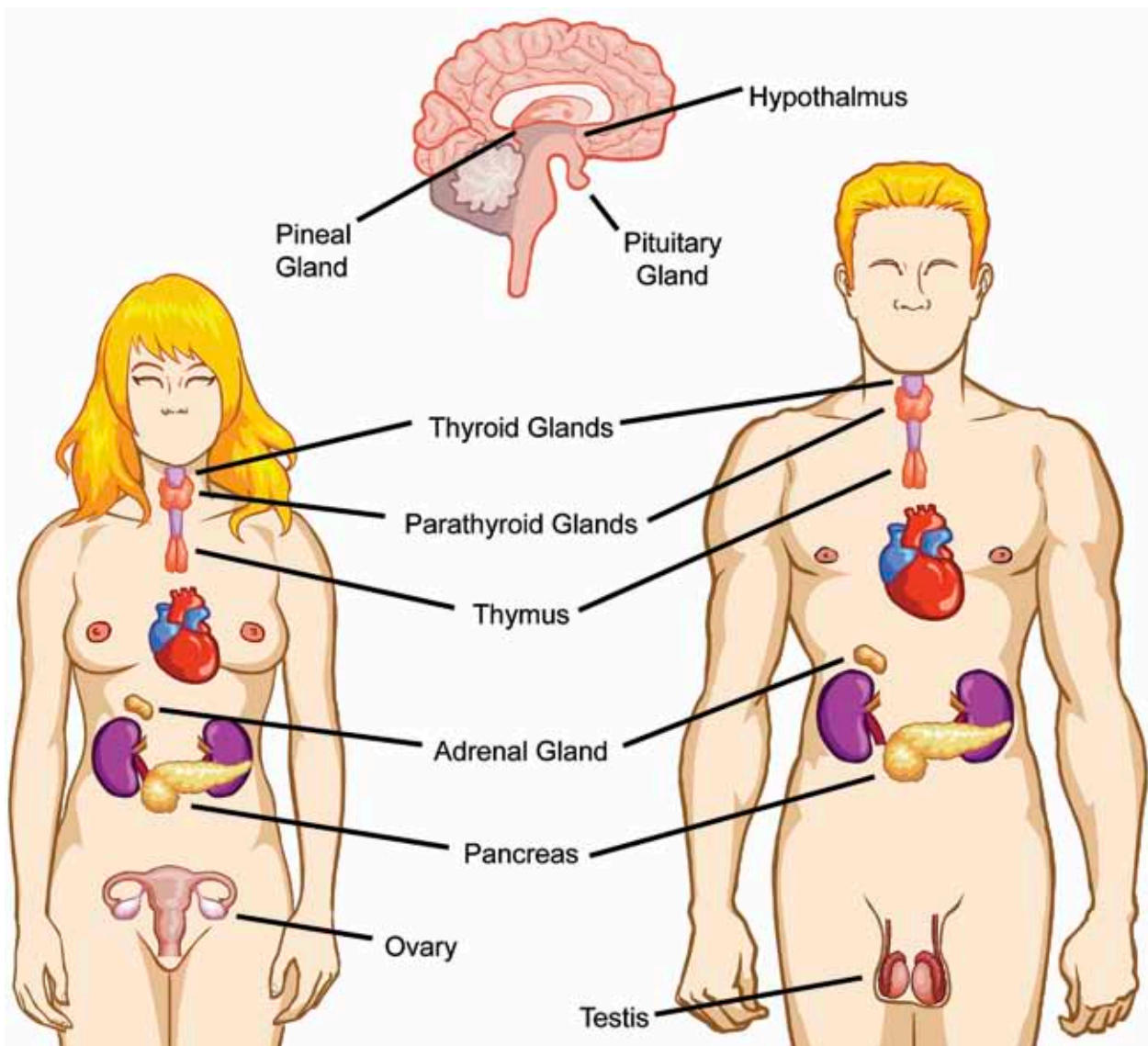
The timing of hormone release is complex. Hormones must be released at the right time to the right tissues in the body. Alcohol abuse can impair functions of the hormone-releasing glands and of the target tissues.

The pancreas produces insulin, which is needed to regulate the amount of sugar in the blood. Drinking causes a steep rise in blood sugar. The pancreas responds by producing insulin, which causes low blood sugar (hypoglycemia). Seventy to 90% of alcoholics suffer high blood sugar to some degree.

Mild effects of low blood sugar can include hunger, nausea, and nervousness. Severe low blood sugar can cause passing out, seizures, and even death. Diabetics should not drink alcohol.

Alcohol use can also interfere with calcium metabolism and bone structure, increasing the risk of osteoporosis, a disease in which bone density declines, increasing the risk of bone fractures. These fractures often occur in parts of the body where healthy people would not normally break a bone such as the ribs, hip, or wrist. Osteoporosis is most common in women over 50 who have undergone menopause.

Heavy drinking may affect the hypothalamic-pituitary-adrenal axis (HPA or HTPA axis) causing easy bruising or acne.



MEASURING HOW MUCH YOU DRANK: BLOOD ALCOHOL CONTENT (BAC)



QUICK FACT

Only one thing lowers BAC – TIME. Coffee and cold showers may make a driver more alert but will not lower BAC or make it safe to drive.

How Drinking Alcohol Makes You Drunk

Blood alcohol concentration continues to rise even after drinking has stopped or you have passed out because alcohol in the stomach continues to enter the blood stream.

Blood alcohol content or blood alcohol concentration (BAC) is the amount of alcohol in a person's blood. BAC is primarily used as a measurement of intoxication for legal or medical purposes.

Each state has individual laws for punishing drivers who operate motor vehicles with an elevated BAC reading. Laws in 50 states and the District of Columbia consider a person legally intoxicated if their BAC is 0.08% or higher.

Mixing alcohol with carbonated drinks will speed up the absorption of alcohol into the blood stream. For teens this is particularly significant, since they often prefer sweeter, mixed drinks.

If a person is not an experienced drinker, a lower BAC will affect him more than someone who has built up a tolerance. A BAC of 0.40% percent will typically kill about half of all adults.

Blood alcohol concentration continues to rise even after drinking has stopped or you have passed out because alcohol in the stomach continues to enter the blood stream. Only one thing lowers BAC – TIME. Coffee and cold showers may make a driver more alert but will not lower BAC or make it safe to drive.

Impairments usually occur once an individual's BAC level reaches 0.05%. Potential problems at this BAC level include:

- Slowed eye movements
- Changes in what you see and in reaction time
- Trouble with certain types of steering tasks
- Difficulty processing information

The number of drinks an adolescent or an adult has is a poor measure of BAC because of variations in weight and sex of the person who is drinking. One standard drink (on average 14 grams) of alcohol, will increase the average person's BAC roughly 0.02% to 0.05%, so two drinks may cause driving impairment.



Blacking Out During Drinking

Heavy drinking can cause blackouts, which are much more common among social drinkers than people used to think. Aaron White, PhD, a former researcher who is now at NIAAA, and his colleagues surveyed 772 college undergraduates, asking them if they ever had a blackout.

Of the students who had drunk alcohol, 51% reported blacking out at some point in their lives and 40% reported experiencing a blackout in the year before the survey. The students said they later learned a number of incidents had occurred during the time they did not remember including stealing, unprotected sex, and driving.

Equal numbers of men and women reported experiencing blackouts, despite the fact that the men drank more alcohol and drank more often than the women. The research suggests women may tend to black out more often and have other forms of alcohol-induced memory loss.

IS IT SAFE TO DRIVE?

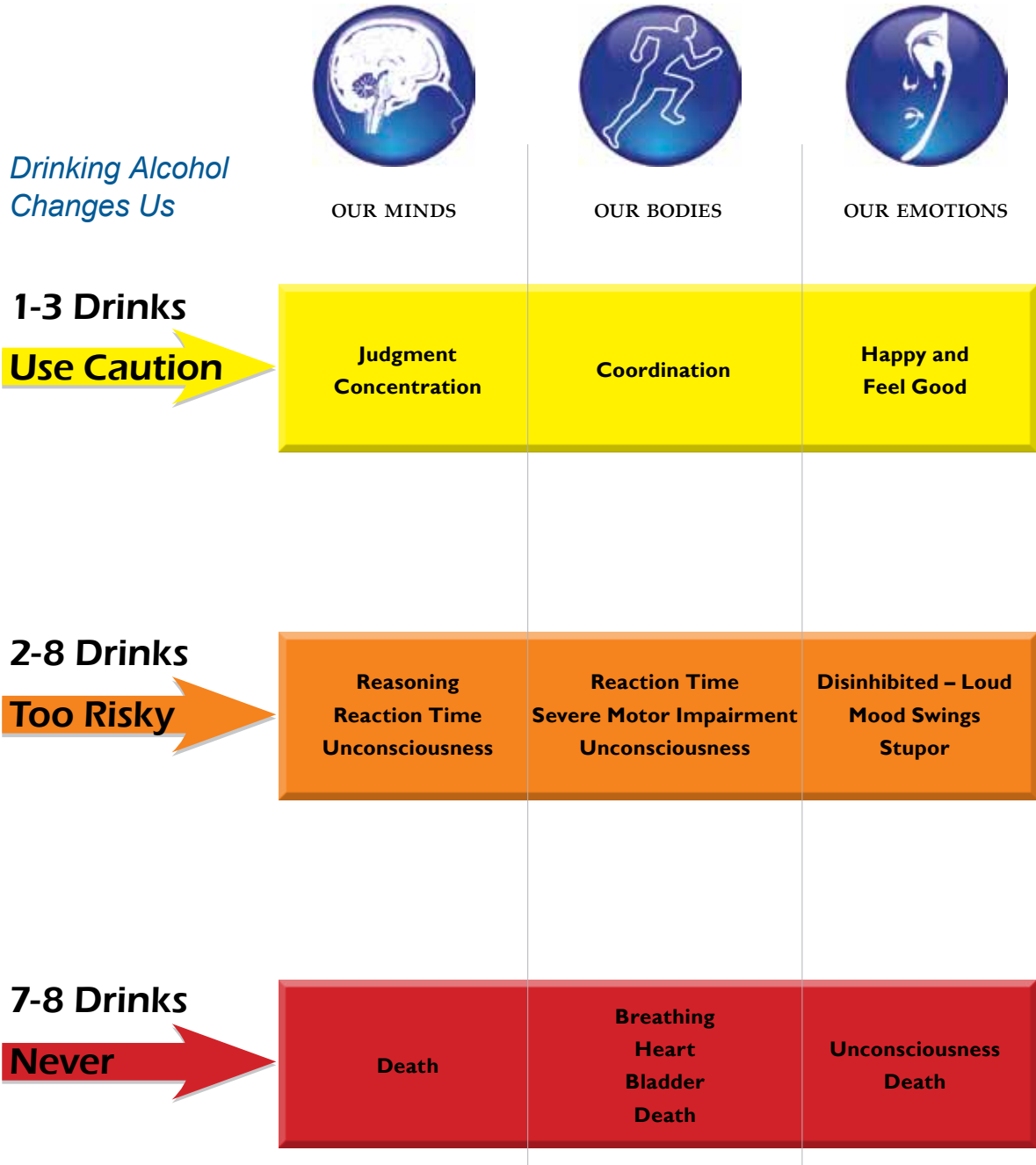
The message never drink and drive is a powerful one, but many teens feel invincible and are risk takers. Explaining how even a small amount of alcohol affects driving ability can help teens make better choices. Height, weight, sex, and whether or not they've eaten in the last couple of hours are factors in how alcohol affects teens behind the wheel of a car. The chart below provides some guidance.

1-3 Drinks Use Caution	1 drink	Male	over 100 lbs	
		Female	over 100 lbs	
	2 drinks	Male	over 120 lbs	
		Female	over 140 lbs	
	3 drinks	Male	over 140 lbs	
		Female	over 180 lbs	
2-8 Drinks Too Risky	2 drinks	Male	under 120 lbs	
		Female	under 140 lbs	
	3 drinks	Male	under 140 lbs	
		Female	under 180 lbs	
	4-6 drinks	Male	over 100 lbs	
		Female	over 100 lbs	
	7 drinks	Male	over 100 lbs	
		Female	over 120 lbs	
	8 drinks	Male	over 120 lbs	
		Female	over 140 lbs	
	7-8 Drinks Never	7 drinks	Female	under 120 lbs
		8 drinks	Male	under 120 lbs
Female			under 140 lbs	

One drink on the chart above is equal to roughly one shot, one 12 oz. beer, or a 5 oz. glass of wine.

WHAT GOES WRONG WHEN WE DRINK ALCOHOL?

It's no secret that alcohol changes us both physically and mentally. A drink or two creates a feeling of elation, but as we consume more everything changes.



Young Scientist May Have Found Flaw in BAC Test

Ciara Stein, a 13 year-old scientist from County Kerry in Ireland, may have discovered a flaw in drunk driving breathalyzer tests. Police make people blow deeply into these devices when they are stopped for possible drinking and driving.

The breathalyzer helps determine how much alcohol is in the blood.

Ciara's research suggests that both diabetics and those on very low-calorie diets are more likely to show false positive results because of chemical changes in their blood.

"The chemical changes in the blood are caused when levels of sugar drop too low," Ciara told the *Irish Times*. "If you are diabetic or you are on a very low-calorie diet, you can become hypoglycemic – your blood sugar is too low. When this happens, you get ketones on your breath," she said.



The simplest ketone is acetone, which can build up on the breath and is perceived by the human body as a danger. The body responds to this perceived threat by changing acetone into a form of alcohol called isopropanol. This chemical is similar to ethyl alcohol in its properties and evaporation rate. Breathalyzers cannot always tell the difference between isopropanol and drinking alcohol.

Ciara's interest in this subject came from reading a report about a pilot from Sweden who was on a low-calorie diet and used a breathalyzer to check his breath for alcohol. The pilot found he registered almost 20 milligrams per milliliter of blood (20mg/ml), even when he didn't drink any alcohol.

Binge Drinking and Alcohol Poisoning

Consuming too much alcohol too quickly causes a breakdown of our body systems that can lead to death. Although teens may feel invincible while drinking, their body systems may react strongly, particularly if they are not regular drinkers.

When a person's body absorbs too much alcohol, it can have a direct impact on the central nervous system, breathing, heart rate, and gag reflex. This can lead to choking, coma, and even death.

The National Institute on Alcohol Abuse and Alcoholism (NIAAA) defines binge drinking as the amount of alcohol leading to a blood alcohol content (BAC) of 0.08%, which for most adults would be reached by consuming five drinks for men or four for women over a two-hour period.

Young teens and college students are most likely to binge drink. Frequent binge drinkers (nearly one million high school students nationwide) are more likely to engage in risky behaviors, including using other drugs such as marijuana and cocaine, having sex with multiple partners, and getting bad grades.

Binge drinking can result in alcohol poisoning, a breaking down of the body's systems that can and does lead to death.

People who are at risk for alcohol poisoning can lose the ability to swallow because their gag reflex, a motor response from the body that prevents choking, is impaired.



So people who have passed out can choke on vomit, accidentally inhaling it into their lungs. This can lead to asphyxiation, or the inability to breathe that leads to sudden death.

As a result, people who survive alcohol poisoning may have irreversible brain damage.

Worry about alcohol poisoning if you see or experience:

- Confusion and stupor
- Vomiting
- Seizures
- Slow or irregular breathing
- Hypothermia
- Unconsciousness



Bad Behavior at 12, Often Drinking at 14

The neighborhood adolescents grow up in, how many young adults they come in contact with, early behavioral problems, and whether or not they live in cities can be strong predictors of whether or not they will drink young. According to a recent research study, while genetics plays a key role, environment is an even greater factor than originally thought.

An early indication of potential alcohol abuse: Girls who had behavioral problems at 12 were much more likely to start drinking by age 14.

Wonder why even though there are several alcoholics in a family, some family members don't have an alcohol problem? Researchers found even if there is a genetic predisposition towards alcoholism in a family, environmental factors can help reduce the lure of liquor. Those who lived in rural areas, perhaps because they spent more time with their parents, were at lower risk than those who lived in urban areas.

Researchers used data from FinnTwin12, a study that followed more than 5,000 twins ages 12-18 identified in Finland's Population Registry Center born from 1983-1987.

The Dangers of Drinking During Pregnancy

Pregnant girls and women should not drink. Alcohol enters a woman's bloodstream and reaches the fetus by crossing the placenta. Because a fetus processes alcohol more slowly than an adult does, the developing baby's blood alcohol concentrations are higher than in an adult's body.

Fetal alcohol syndrome is the medical term for damage to an unborn baby caused by the mother drinking too much alcohol. The greatest danger is in the first trimester of pregnancy as the baby's organs are forming. Some of the problems that may result due to fetal alcohol syndrome are:

- Small size or stature in relation to peers
- Facial abnormalities such as small eye openings
- Poor coordination and/or hyperactive behavior
- Developmental disabilities such as speech and language delays
- Mental retardation or low IQ
- Poor reasoning and judgment skills
- Miscarriage and death





Talking to Your Kids about Science and Alcohol

I was chatting with a fellow mom recently about our 13 year-old sons. It was one of those reassuring parent conversations when both of you realize your child's crazy behavior is normal for his age.

We discussed how our sons had figured out that the end of eighth grade doesn't count toward high school. That they are scared of taking this next step but will not admit it. That they don't appear all that interested yet in alcohol.

According to a recent study, 14 year-olds are three times more likely than 13 year-olds to attend parties where parents are "supervising," and kids are drinking alcohol behind their backs. Science can help you broach the subject without seeming preachy.

I attended the 51st International Conference of Young People in Alcoholics Anonymous (ICYPAA), sat in on more than a dozen sessions, interviewed attendees, and listened to the stories of many others. Almost all of these young alcoholics began drinking in middle school or freshman year of high school.

Why? High school can be terrifying. No matter what your children hear from friends and older siblings, they cannot imagine what high school will be like. They desperately want to fit in. If that means chugging Red Bull, they may well do it. If their friends have upgraded to beer, they will consider and possibly do that.

Now that you've heard why you should talk to your adolescent about alcohol and science, and have a better understanding of how alcohol affects the body, it's time to begin the discussion. Even though your child might be arguing with you about everything else, it's hard to argue with science. That's what we're counting on.

WHAT'S INSIDE:

- Is my child drinking quiz
- The message your drinking sends
- Does Just Say No work at all?
- Sports performance and hangovers
- Best ways to discuss your alcohol use
- How family dinners build strong bonds

THE BENEFITS OF ONGOING COMMUNICATION

Children grow up far faster than they did a generation ago and are exposed to much more at a younger age. While you can monitor your child's usage of the Internet, you can't spend hours standing behind him while he's on the computer. Drugs, alcohol, and sex are only a keystroke away.

Television and other media regularly depict teens drinking and having fun. Take the college soap opera *Greek*, for instance, which chronicles life in fraternities and sororities on an imaginary campus. The prime-time show consistently uses bars and alcohol jokes as a backdrop for teen life.

School counselors and psychologists, among others, recommend the best time to start talking with your children about drugs and alcohol is late elementary school.

A recent report found that talking to kids about alcohol and drug use can influence their behavior and reduce the number of teens that try them. While the results are not startling, every little bit helps. For example, when parents talked to teens about alcohol, the percentage of those who used dropped from 18.3% to 16.2%.





WHAT YOUR TEEN DOESN'T KNOW



QUICK FACT

The U.S. Surgeon General estimates that about 5,000 people under age 21 die from alcohol-related injuries involving underage drinking each year.

AAAS conducted an online survey with seventh graders spanning several middle schools in the northeastern United States. Responses from 143 students show they know very little about the science of alcohol, what it is made of, and how it affects the human body.

Students were best informed about hangovers and what caused them. They knew a hangover was the result of drinking alcohol and could occur after consuming multiple drinks.

But they had little scientific knowledge, and most of what they knew came from unreliable sources. The following synopsis shows their answers to four of the survey's questions.

What is a hangover?

Sixty two percent of students knew that a hangover was the result of drinking too much, although the descriptions of how it made the drinker feel were quite varied. Thirty percent didn't know the answer or skipped the question. The remainder couldn't answer it. Some of their answers regarding hangovers included:

- The after-effect of when you get drunk.
- When you are drunk one night and wake up sick and dizzy.
- When you are sick with a headache and throwing up because you drank too much alcohol earlier.
- When you wake up in the morning still drunk.
- When you drink too much and cannot make good decisions.
- When the brain swells and presses onto the sides of the skull.

(Answer: Hangovers are caused by drinking large quantities of alcohol, usually more than three to five alcoholic drinks for a woman and more than five to six for a man. About 75% of people who drink until they are drunk will have a hangover the next day. Symptoms include dehydration, headache, nausea, and sleepiness.)

What is the alcohol that people drink made from?

Almost 50% of students had no idea where alcohol came from. Six percent thought it came from a plant, and 12% said it came from a combination of yeast, barley, hops, grapes, or a combination of all three. A few responses:

- I do not know. I think you make wine by squishing fruit in a tub.
- I think it is made from corn.
- Nicotine I think, or is that only cigarettes?
- I don't really know, but there must be some kind of addictive material in there, right?

(Answer: Alcohol comes from fermentation, the process through which carbohydrates such as sugar are turned into alcohol. Sugar is found in fruits such as grapes, which is how wine is made.)

Why does alcohol make people drunk?

Twenty nine percent did not know the answer, and the rest thought they knew, guessed, or provided some semblance of a correct answer. Responses included:

- Nerves in the body get over-active, and then you have no control over them.
- Alcohol affects your blood system and causes your brain to not function clearly.
- It messes up the immune system.
- Many chemicals are in the drink that the body can't handle.
- Alcohol slows down the nervous system.

(Answer: Ethyl alcohol is a chemical that alters brain function, causing temporary changes in behavior, mood, and perception, among other things.)



What are the main body systems affected by alcohol?

Thirty percent of respondents could not answer the question, 10% mentioned at least one body system that is affected by alcohol, and the rest named organs or gave answers that didn't respond to the question.

(Answer: All body systems are affected by alcohol because it flows through them in our blood. The major ones affected are the central nervous, cardiovascular, digestive, and endocrine systems.)

TEACHING MIDDLE SCHOOL STUDENTS ABOUT THEIR BODY SYSTEMS



QUICK FACT

Drinking alcohol could make you gain weight. One 12 ounce beer or a shot of liquor contains up to 200 calories.

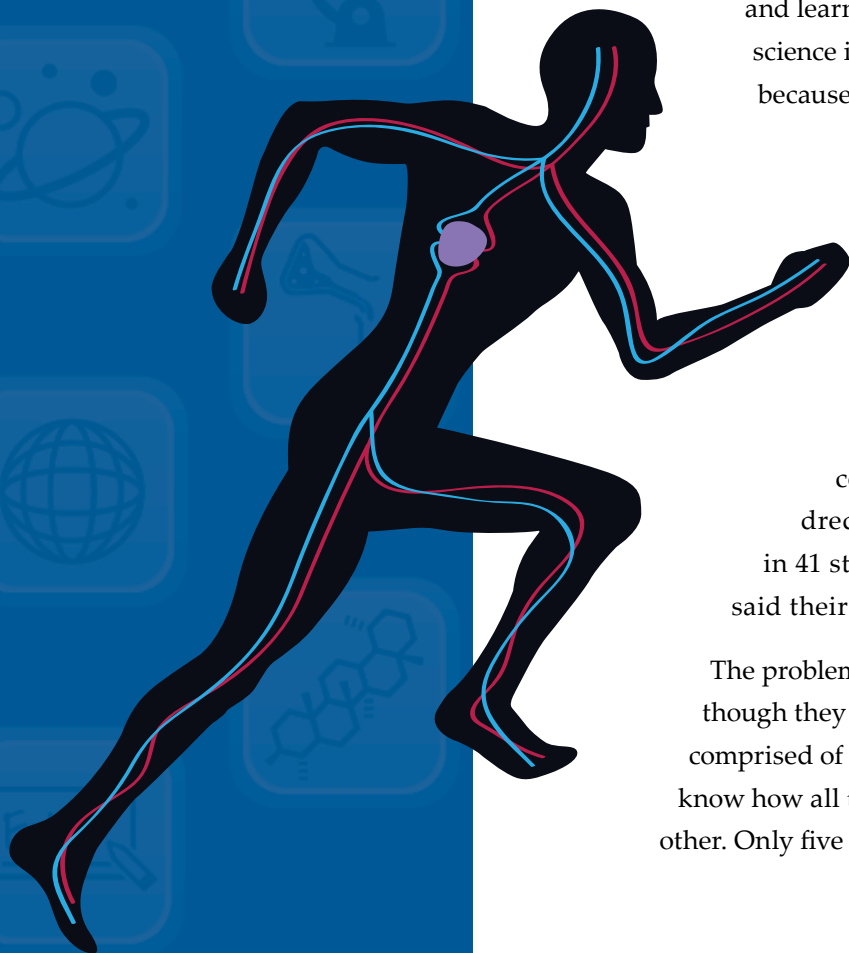
Alcohol education is included in most health classes taught during middle school, but the level of detail varies from state to state and school to school.

While there is similarity in the science standards and learning goals among multiple states, little science is involved in the alcohol curriculum because it is taught mostly by health teachers.

Little time is devoted to explaining how alcohol affects adolescent bodies.

AAAS conducted a survey of middle school science and health teachers, asking if their school or district covered alcohol concepts during these years. One hundred and sixty-six middle school teachers in 41 states participated. Sixty-five percent said their schools provide alcohol education.

The problem is that middle school students, although they understand that the human body is comprised of different systems, do not necessarily know how all the systems work or interact with each other. Only five percent of teachers said curriculum



focuses on body systems in middle school, 22% said they address it once a year, and 46% never include it in their science curriculum.

Students begin learning about body systems in elementary school. In grades three to five, they are taught that the body is one whole organism. In the sixth grade and beyond, they begin to understand how organs and organ systems work together. For instance, a middle school student should know that the brain is part of the nervous system and works in conjunction with neurons (cells). The nervous system supports all other body systems, such as the musculoskeletal system.



Even after traditional instruction about the nervous system, fifth grade students may not understand that the brain controls involuntary behavior, studies say. If students don't get this concept, they will have trouble making deeper connections about how the human body works and processes substances that it ingests.

By the end of eighth grade or most middle school years, according to the standards, teens should know that:

- Body systems support processes, as well as organs, and other bodily functions
- Every part of the body relates to another within a system
- Body systems are connected to other body systems

Section 2 of this book contains detailed information on the body and systems affected by alcohol. Searching for Web sites to help teens understand the human body from a systems perspective yielded a few good resources. Check out:



BBC Science & Nature: Human Body & Mind

This excellent Web site provides activities to learn about each body system. Check out the organs game, muscle game, and skeleton game.

www.bbc.co.uk/science/humanbody/body/index_interactivebody.shtml

HowStuffWorks.com

This site has 15-17 minute videos of each body system. The information is very good, even though your child may not be willing to sit through more than one video. Start with the one on the CNS.

videos.howstuffworks.com/health/body-systems-videos.htm

Neuroscience for Kids

This site from the University of Washington Engineered Biomaterials Department in Seattle, focuses primarily on neuroscience. Check out the section on neurons, which shows how they work within the human body.

faculty.washington.edu/chudler/experi.html

Kid'sBiology.com

This site discusses all of the different body systems, the organs within them, and how they work together. It's a fun site, and the Central Nervous System is described in a nasal Brooklyn accent.

www.kidsbiology.com/human_biology/nervous-system6.php

Does Just Say No Work at All?

Drug Abuse Resistance Education Program (D.A.R.E.) is a popular, police-led series of classroom lessons taught in K-12 schools. D.A.R.E. was founded in Los Angeles 25 years ago and is now being implemented in 75% of U.S. school districts and in more than 43 countries around the world.

Estimates are D.A.R.E. costs about \$2 billion a year to run and manage. Specially trained police officers guide students through strategies they can apply when alcohol is offered. The “Just Say No and Here’s How” model is designed to give students decision-making strategies and help them make wise choices.

But academic researchers point out that published reports have not found D.A.R.E. to be effective. In some districts they say, students who took the program later drank more alcohol and did more drugs than those who didn’t.

D.A.R.E. officials, who declined to discuss the program for this book, claim that the revised model works better. The new curriculum has a number of changes including enhancement lessons allowing each district to customize what is taught for its needs.

But according to David Hanson, Ph.D. and Professor of Sociology at the State University of New York at Potsdam, the D.A.R.E.



program has undergone 13 revisions, and the results remain the same.

So will the D.A.R.E. program remain the main way school districts address alcohol and drug education? D.A.R.E. is popular with parents, school administrators, and local police departments who want to demonstrate they are taking action.

GETTING YOUR ADOLESCENT'S ATTENTION



QUICK FACT

Put your child on a tricycle and make him go around and around in tight circles for five minutes. The reduction of motor skills is similar to what happens when alcohol affects the brain.

If you don't engage middle school students quickly, they stop paying attention. Holding that attention is even harder.

Most of what a parent says to a middle school child, from their viewpoint, is wrong. The young adolescent knows everything. Frustrating, but normal behavior, it's part of your child's process of becoming independent.

Don't give up. Remember, even though the response may be rolled eyes, turning away, or nothing at all, he is listening to you. Middle school kids still hear their parents. They still know they need you, even though they'll never admit it. By high school, many teachers told us, that window of opportunity is gone.

There is no right or wrong way to start a conversation with a young teen, but experts say to avoid a few things:

- Pick the right time – one without conflict when all is going well.
- Don't be preachy.
- Don't try to be their friend and confidant.
- Keep the conversation brief, and don't force it.
- Most important, don't give up.

The underlying message that you shouldn't drink may get lost in explaining the science. So, be particularly careful to share the reasons that drinking can be harmful to adolescents' bodies and brains and reinforce them as you continue.

Several of the mothers interviewed for this book suggested capitalizing on “teachable moments.” Every year, it seems, there is a story about high school students who get drunk and crash a car after the prom. Often someone dies.

Your child may be a friend of a friend of a teen in that car or know someone who was in it. Even if there is no direct connection, a life that was just beginning has been lost horribly. What better time to make an emotional connection to fellow students?

A mother of 17 and 13 year-olds says, “I started talking to my older son in sixth grade by telling him that I know as he gets older there will be some experimentation with alcohol and drugs. When our orthodontist’s 19 year-old son was killed in a car accident, and the other driver was drunk, I brought up alcohol then, and it really got his attention.”

Ask simple then increasingly probing questions such as:

- Have you ever seen anyone who was drunk?
- What did they act like?
- Do any kids at school drink?
- Have kids ever brought alcohol into school?
- Have you ever been offered alcohol?
- What did you do or say?

Make sure you let your child know she won’t get in trouble, and you won’t tell anyone what she’s told you. If you make an issue out of what she reveals, she’ll be reluctant to confide in you again.

You may want to talk about some of the interesting aspects of alcohol such as we don’t drink cleaning solutions but many have alcohol in them. Don’t render judgment, just explain why alcohol is restricted, and how and why the drinking age became 21.

Facts and statistics are always helpful. Here are data on binge drinking and alcohol deaths that you may want to share.



- **When kids drink, they drink way too much.** There are nearly 7.2 million underage binge drinkers in the United States, meaning they drank more than five drinks on one occasion.
- **The U.S. Surgeon General estimates that about 5,000 people under age 21 die** from alcohol-related injuries involving underage drinking each year.
- **Sam Spady is a perfect example of how drinking too much can kill.** A college student at the University of Nebraska, Spady died of alcohol poisoning in 2004. Her parents started a foundation, and her story can be found at www.samspadyfoundation.org.

Families with a history of alcoholism must address it head on and as early in their children's lives as possible. Don't shy away from warning your teens that they are at higher risk for having problems with alcohol. Members of Alcoholics Anonymous refer to alcoholism as "my disease." Alcoholism can be managed as long as it's acknowledged and dealt with. What you want to avoid is a teen who is drinking and denying it.



REVEALING YOUR OWN EXPERIENCES

There is no right answer to what you should tell teens about your own experiences with alcohol and drugs. Some parents share a lot, while others don't say much at all. Experts agree that if your adolescent asks, you shouldn't lie.

"Adolescents have well-developed sonar systems to detect hypocrisy. The moment they catch you in a lie, you lose all credibility with



QUIZ: IS MY CHILD DRINKING?

There are multiple warning signs that your child may be developing a problem with alcohol.

These warning signs and advice are a compilation of information gathered from leaders of alcohol and drug treatment facilities interviewed for this book. They may indicate a drinking problem but could also be indicative of other issues.

- Your teen becomes more argumentative** – Have you noticed that one minute your child is happy and giddy, then becomes withdrawn, depressed, or explodes into fits of anger or rage? This type of volatility can be a sign that he is altering his mood with substances.
- Your teen stays in his room a lot** – If your child is drunk or on drugs at home, or sneaking alcohol, he will be scared you'll find out. This means when he's using, he'll avoid you by remaining in a place where you don't usually go. His room is a sanctuary where he can be high or drunk in private.
- Your teen's sleep patterns change** – You know your child better than anyone. Many teens stay up and sleep late. A sudden shift can be a sign of substance abuse.
- Your teen has a new group of friends** – Adolescents who drink often seek out others that can help them obtain alcohol or start attending parties where they can find it. Some kids move from group to group to hide their drinking from everyone.
- Your teen's grades decline** – If your child's grades suddenly decline it could be a big red flag something is wrong.
- Your teen asks for money without a good explanation** – Has your child recently started asking for more spending money, or is cash disappearing from the house? That could be an indication of alcohol purchases.

them,” explains Rebecca Kullback, a family therapist who runs Metropolitan Counseling Associates in Bethesda, MD.

Yes, I tried that when I was in college is always better than I never drank. As one parent of two adolescent girls put it, “My wife and I drink wine with dinner frequently, and we’re very open about it. If you make alcohol something mysterious and forbidden, they’ll only want to try it more.”

One mistake parents make is telling stories about drunken escapades that sound like fond memories. Be sure to choose stories that point out how bad alcohol use can be. Discuss how sick you got, how scared you were, or how an embarrassing situation followed heavy drinking – not how your college roommate danced on the bar and everyone cheered.



LISTEN TO WHAT YOUR TEEN HAS TO SAY

Most parenting books and Web sites tell parents to listen. But how many times have you half-listened to what your child is telling you? Put aside the bad day you had at the office or what you’re going to make for dinner. If you’re not really listening, teens will know. And they’ll stop listening, too.

Mary Lou Lipscomb, a former middle school science teacher who taught for 34 years, explains, “If your kid comes home and says his friend Jamie got busted, ask questions like did you think the punishment was fair or not? Then listen to what else he has to say.”

FAMILY DINNERS MAKE A BIG DIFFERENCE

Have dinner with your children several times each week. In our crazy busy lives, it's hard to make time for sitting down with family, particularly when parents and caregivers work long hours. But research shows that even those few minutes each day can help kids feel loved and engaged.

Get them involved in organized sports. Sports require good athletic conditioning, and kids who drink before a game will not perform well. If your children are competitive, sports will bring out that spirit in them. Plus coaches provide another watchful set of eyes.

Keep building self-esteem. When young people feel good about themselves, they are less likely to look to alcohol and drugs to change how they feel. Take time to praise them when they've done well. It will definitely pay off.

Talk to your kids regularly. Even if they don't always want to tell you about their daily lives, showing an interest in your children's lives will help them know you care and you're watching. And when the time comes that they want to confide in you, they will.

Get them involved in community or faith-based youth groups. A strong, supportive network of adults and peers can help keep kids from drinking and taking drugs. There are many community groups they can join that provide activities for youth and families.





Listening validates an adolescent in a way that almost nothing else can. Lipscomb explains that when she taught eighth grade, she let her students lead their parent conferences. Parents knew about this ahead of time. She says the response was overwhelmingly positive because the kids had a voice in telling their parents what was happening in school. If you're really listening then:

- Stop what you are doing
- Look at your child
- Clear your mind and give your full attention
- Comment on what you think you heard
- Let your child tell you if you're right, and if she says you're not, ask her to explain
- Keep asking questions until you understand what she said
- Respond if asked to, but otherwise just start listening again

CONNECT ALCOHOL AND SCIENCE TO TEEN LIFE

Young teens are very self-conscious. What they look like, who they are seen with, what they're wearing, and dozens of other me-oriented issues take on great importance. Being cool is everything.

Parents can capitalize on this age group's self-involvement. Alcohol abuse can cause memory loss, impair sports performance, lead to embarrassing behavior, and affect how teens feel and look. Make young adolescents aware of how alcohol abuse can ruin a party, event, or their lives.

Here are three questions you can ask your teen to answer which will help connect alcohol's effects on the body to his or her life.

1. Can drinking alcohol make you gain weight?

The Internet is filled with misinformation about alcohol. Some Web sites claim it is a weight loss tool because drinking heavily makes you eat less. But alcohol is filled with empty calories, so it can't substitute for food and keep you healthy.

Other sites claim that alcohol is an energizer that can help burn calories. But it's actually a central nervous system depressant and that burst of energy is followed by a body slowdown.

You can dispel these claims by teaching your teen the facts.

Alcohol lowers blood sugar levels by preventing the breakdown of sugar in the liver, which sends hunger signals to the brain. Willpower can go out the window when the snack attacks kick in.

One 12 ounce can of beer ranges from 140 to 200 calories, while a shot of liquor can be up to 200 calories. Mixed drinks, which often appeal to teens because they're sweeter, can range from 280 calories for a gin and tonic to 800 calories for some creamy frozen drinks.



Nutritional Content of Various Beverages

Alcoholic Beverage	Calories in one drink	Carbs (grams)	Fat (grams)
Beer (regular)	146	13.13	.000
Beer (lite)	99	4.60	.000
All distilled spirits (rum, vodka, whiskey, gin, tequila, bourbon, etc.)	97	0.00	.000
Wine (red)	74	1.75	.000
Wine (white)	70	0.82	.000
Non- Alcoholic Beverage	Calories in one drink	Carbs (grams)	Fat (grams)
Apple juice (unsweetened)	117	28.96	.273
Apricot juice	140	36.11	.226
Carbonated cola	155	39.77	.000
Grape juice (unsweetened)	155	37.84	.202
Grapefruit juice (unsweetened)	94	22.13	.247
Lemonade	131	34.05	.149
Milk (2% fat)	122	11.41	4.807
Orange juice (unsweetened)	112	26.84	.149
Prune juice	182	44.67	.077
Tangerine juice (unsweetened)	125	29.88	.098
Tomato juice	41	10.30	.122

Source: Center for Science in the Public Interest and United States Department of Agriculture Nutrient Database for Standard Reference, Release 16-1 and 17. Available at www.nal.usda.gov.



2. Can drinking alcohol hurt your sports performance?

Absolutely. Studies show that drinking alcohol can impair an adolescent's sports performance for up to 72 hours. Alcohol can cause:

- **Muscle cramps:** During exercise, muscles burn sugar, producing lactic acid. Too much lactic acid leads to muscle fatigue and cramps. Drinking can lead to a bigger build up of lactic acid and increase the risk of cramping.
- **Decreased endurance level:** The blood sugar a body needs for energy is produced by the liver releasing glucose into the bloodstream. Alcohol reduces your ability to produce this sugar, so you have less energy and endurance.
- **Slowed reaction time:** Alcohol slows down the central nervous system and the brain's ability to process information. As long as alcohol remains in the body it can affect reaction time, coordination, accuracy, and balance – all of which are important to optimal performance in sports.

3. Is it possible to sober up by drinking coffee or cola and drive someone home safely?

No. Coffee or cola may wake you up, but they cannot change the effects of alcohol. If a child's ride has had more than a drink or two, tell him to call you for a ride home, no questions asked.



SURVIVE AND HELP YOUR KIDS DO THE SAME

Parents are at a real disadvantage with middle school kids because everything they say, well meaning or not, is met with the response “You’re wrong.” Young teens are finding out who they are and that often means challenging those who have guided them so far. Put a new person in the mix, particularly an older boy or girl, and they gravitate right to them.

That’s the premise behind a pilot program held at Lincoln Middle School in Lancaster, PA. Five eighth grade boys were matched with mentors from Thaddeus Stevens College of Technology, who had experienced problems with alcohol and drugs. They met once every six weeks for a couple of hours.

“They start drinking or taking drugs at 12 or 13, because they have a problem and just want to escape for a little while,” explains Janice Thomas, who oversees the program. “They long for the white picket fence family.”

The student mentors could not replace the image of a “perfect” family, but they could get the boys to open up and talk to them. Each session opened with two questions, “What is bothering you? And what are you faced with each week?”

John Loeb, a 24 year-old who is more than three years sober, has come a long way from stealing his parents’ liquor and smoking pot at age 13. He and the other mentors were trained to tread carefully around



the issues of their own drug and alcohol use, because they didn’t want to send the message that you could abuse drugs and alcohol and still turn out OK.

“I thought it would be a lot harder,” John said. “But the kids were just like me when I was growing up.”

One of the most successful days was a visit to the mentors’ college campus. The middle school students were fascinated by the technology. They learned a valuable lesson: If you avoid alcohol or drug problems, you have endless possibilities for the future.

DRINKING AND DRIVING

While middle school students can't get behind the wheel yet, as they get closer to high school, they go to parties where older kids who've been drinking end up driving them home.

Young teens should be able to identify signs (forgetfulness, slurred speech, stumbling, speaking loudly, and aggressiveness) that an adult or teen has been drinking.

It is estimated that more than 10,000 young people in the United States are killed and 40,000 are injured in auto accidents when alcohol is involved. Of the 5,000 total alcohol-related deaths among 18 to 24 year-olds, 80% or 4,000 were alcohol-related traffic deaths.

The National Highway Traffic Safety Administration estimates more than 26,000 lives have been saved since the drinking age was increased to 21. The Mothers Against Drunk Driving (MADD) Web site chronicles 46 high-quality studies that all found the 21 Law saves lives. Go with your child to www.madd.org. It tells stories of teens killed in drunk driving accidents. They are a powerful reminder of what can happen.



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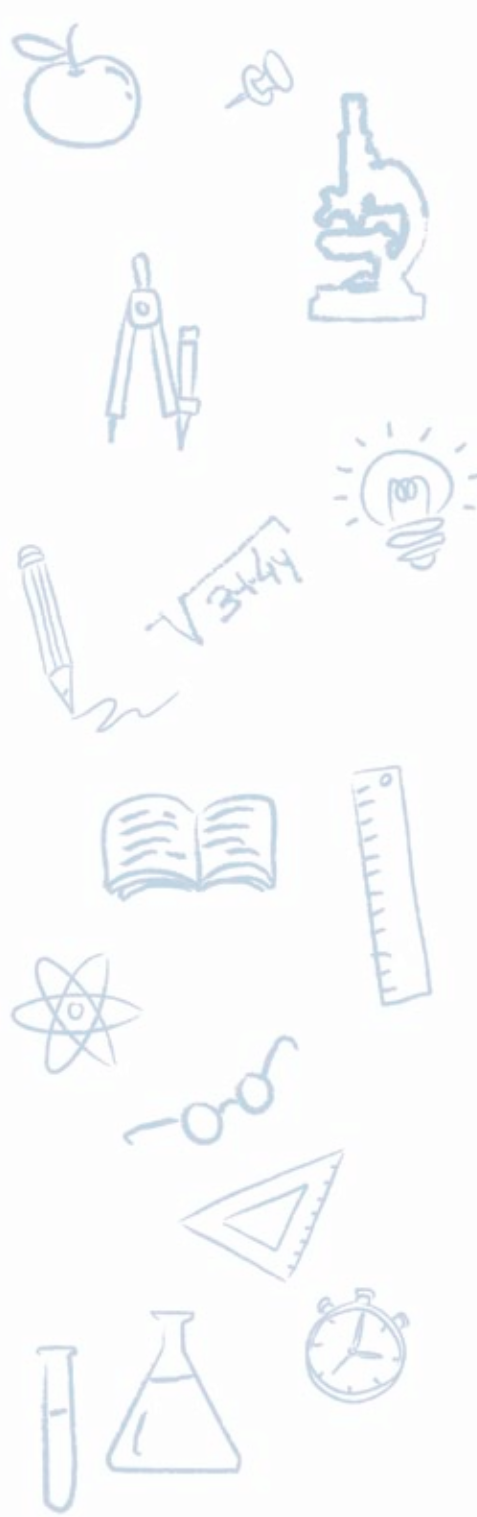
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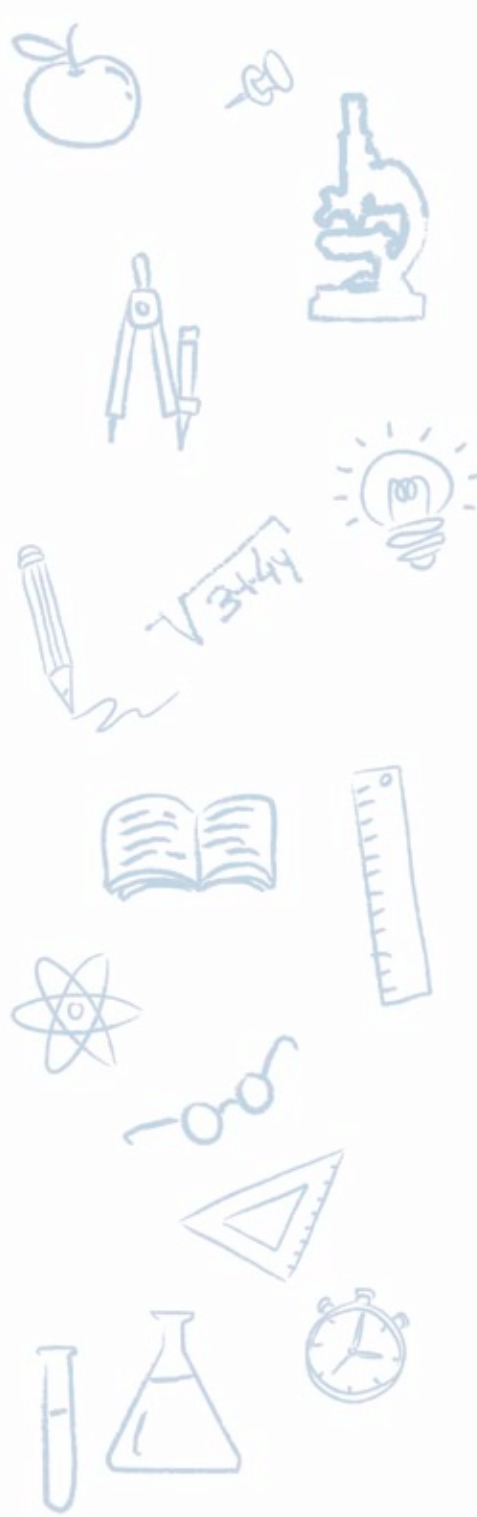
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Alcohol Resources for Parents

AAAS SCIENCE INSIDE ALCOHOL PROJECT OUTREACH PRODUCTS

Our Facebook Page – To get the word out and build a network of parents we’ve launched a Facebook page that highlights all that we learn as we work on this project. News includes links to videos and articles on middle school students.

www.facebook.com/pages/Science-Inside-Alcohol/33451484521

Our Curriculum – AAAS developed several lessons on alcohol and science for teachers of middle school students and after school programs. They focus on human body systems and the science of how alcohol affects them.

www.thinkfinity.org or www.sciencenetlinks.com.

The Science Inside Alcohol eBook – Parents, teachers, and other adults tell kids that alcohol is bad for them all of the time. But how often do they explain the effects that drinking alcohol have on a teen’s body and its interconnected systems? This e-book for middle school students explains the science.

www.sciencenetlinks.com/alcohol/ebook/

Our Web Site – This site explains our NIAAA grant and the products under development. It also showcases media coverage of this project and press releases. It also provides links to products.

www.aaas.org/programs/education/ScienceInside/alcohol/



Federal Agencies

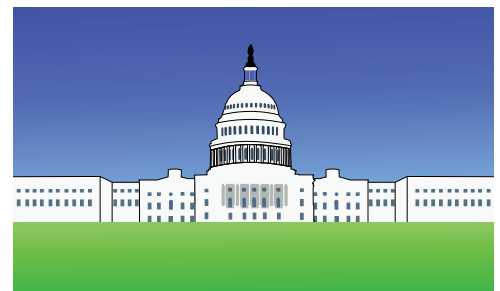
Stop Underage Drinking is a portal that steers you to several federal agencies with programs and information on teens and alcohol. There are resources for parents including links to Web sites you can review with younger children (9-14) that are fun and quite informative.

www.stopalcoholabuse.gov/

National Institute on Alcohol Abuse and Alcoholism (NIAAA)
Bethesda, MD

www.niaaa.nih.gov

NIAAA is the leading federal agency in the national effort to reduce



alcohol-related problems among adults, teens, and children. NIAAA funds close to 20 scientific research centers at colleges and universities across the country as well as federal programs to raise the visibility of alcohol issues. A few key products include:

Alcohol Alerts: A quarterly publication that provides updated scientific research information on subjects like how alcohol affects the brain and alcohol-related diseases.

www.niaaa.nih.gov/Publications/AlcoholAlerts/

Fact Sheets and Studies: There are several information sources that provide statistics on underage drinking and how it affects families.

www.niaaa.nih.gov/AboutNIAAA/NIAAASponsoredPrograms/underage.htm

Substance Abuse and Mental Health Services Administration (SAMHSA)

Washington, DC

www.samhsa.gov

This federal agency works to improve the quality and availability of substance abuse prevention, alcohol and drug addiction treatment, and mental health services. One key resources:

Need data on teen alcohol abuse? The National Household Survey on Drug Use and Health (NSDUH) is an annual federal survey on drug abuse which breaks down data by age.

oas.samhsa.gov/nhsda.htm

Drug Policy Information Clearinghouse

Rockville, MD

www.whitehousedrugpolicy.gov

This White House level office explains on its Web site how drugs get into our kids' hands, treatment options, and federal steps to win the drug war. Its parent Web site has a video reinforcing that parents know a lot less about their kids' world than they think they do. The site also has advice, data, and news on drugs and teens.

Office of the Surgeon General

Call to Action to Prevent and Reduce Underage Drinking

Washington, DC

This site has quite a lot of information on alcohol and drug use. Data is all research-based.

www.surgeongeneral.gov

The Department of Health and Human Services (DHHS) oversees the Office of the Surgeon General and is considered the principal agency for protecting the health of all Americans. The Surgeon General's site has come out with a national report that helps explain problems and approaches to teen drinking.

www.surgeongeneral.gov/topics/underagedrinking/CommunityGuide.pdf

National Clearinghouse for Alcohol and Drug Information

New York, NY

www.ncadd.org

NCADD offers alcohol-related education and information to the public and advocates prevention, intervention, and treatment through a nationwide network of affiliates. It provides a toll-free Hope Line (800-NCA-CALL) and access to its National Intervention Network (800-654-HOPE) for families and friends of addicts.

Federal Trade Commission

The federal government, supported by the Century Council, launched the We Don't Serve Teens Web site to provide tools for parents and other adults to reduce underage access to alcohol.

www.dontserveteens.gov/

Alcohol Research Programs

National Center on Addiction and Substance Abuse at Columbia University (CASA)

New York, NY

www.casacolumbia.org

CASA Columbia is the only national organization that studies the use of alcohol, cigarettes, marijuana, and other drugs across a broad swath of the American population. Its *National Survey of American Attitudes on Substance Abuse XIII: Teens and Parents* comes out every August and offers valuable information on what helps prevent and encourage alcohol and drug abuse within families.

University of California at Berkeley, Alcohol Research Group

Berkeley, CA

www.arg.org

Established in 1959, the Public Health Institute is one of 18 academic research groups funded by the federal government that studies the effects of alcohol on people of all ages. It publishes information that can be of use to parents.

Don't Panic! A Parent's Guide to Understanding and Preventing Alcohol and Drug Abuse details how to raise children in a world where they confront drugs —legal or illegal— every day. It's from the Stanton Peele Addiction Web site.

www.peele.net/lib/panic.html



Foundations

Robert Woods Johnson Foundation

Princeton, NJ

www.rwjf.org

For almost two decades this Foundation spent more than \$400 million to prevent underage drinking and other substance abuse among teens. It is funding less alcohol work these days, but just launched a major project. The Web site chronicles many of the results from its alcohol research.

Open Society Institute

New York, NY

www.soros.org/initiatives/treatmentgap

The Closing the Gap Addiction Treatment Program is a three year series of partnerships that focuses on expanding treatment for alcohol and drug abuse. Eight U.S. states and territories including New York, New Jersey, and Puerto Rico are involved. Grants are no longer available, but if you check the site you can find out if there is a project in your area.

Kate B. Reynolds Charitable Trust

Winston-Salem, NC

www.kbr.org/reclaiming-futures.cfm

The Reclaiming Futures program in North Carolina focuses on improving treatment for alcohol and drug addicted teens who are in the juvenile justice system. In partnership with the Robert Woods Johnson Foundation, the Trust invested more than \$1.8 million in 20 sites that are training those who work with teens and creating support groups for them on how to best address these problems.

Daniels Fund

Denver, CO

www.danielsfund.org

Bill Daniels, who struggled with alcoholism before receiving treatment at the Betty Ford Center, founded this organization. It funds projects in Colorado, New Mexico, Utah, Wyoming, and a few broader national programs. Regional programs are rarely funded over \$100,000.

Goldsbury Foundation

San Antonio, TX

www.goldsbury-foundation.org

This foundation helps youth, family, and school groups in Texas, especially in the San Antonio area. Its Healthy Choices Program focuses on reducing risky behavior through education, community involvement, and improved family communications.





Alcohol-Related Nonprofits and Associations

Alcoholics Anonymous (AA)

New York, NY

www.aa.org

The best known program to help people stop drinking in the U.S. and increasingly overseas. Alcoholics Anonymous helps everyone from teens to adults. Its 12 step program, which is run by volunteers, encourages alcoholics to admit they have a problem, make amends to those they've wronged, and help others get sober. The Web site has a quiz for teens to identify if they have a drinking problem.

http://www.aa.org/pdf/products/f-9_aMessageToTeenagers1.pdf

You can find AA meetings in the U.S. and Canada at the following link from the site http://www.aa.org/lang/en/meeting_finder.cfm?origpage=29

International Conference of Young People in Alcoholics Anonymous (ICYPAA)

www.icypaa.org

ICYPAA is an annual conference attracting thousands of young people who are part of Alcoholics Anonymous. Stories of dealing with and overcoming alcoholism, the Twelve Steps, and social events are all part of the program. The sense of community at this conference is very strong and helps reinforce the importance and benefits of sobriety.

Mothers Against Drunk Driving (MADD)

Irving, TX

www.madd.org

Started 25 years ago by a mother whose 13 year-old daughter died in a car crash, MADD's mission is to stop drunk driving, support the victims of this crime, and prevent underage drinking. A major focus is helping people who have lost children to drunk drivers cope. The site is a good alcohol education data source.

Partnership for a Drug Free America

New York, NY

www.drugfree.org

An excellent resource for parents to learn about substance abuse and how to deal with it. Partnership members include parents, scientists, and communicators who have helped design and implement a national education program and online resource center. The Web site has a well-written parent tool-kit tackling hard to address issues such as what to tell your kids about your own drug and alcohol use.

Students Against Destructive Decisions (SADD)

Marlborough, MA

www.sadd.org

SADD is a community of teens focused on prevention of decisions that will mess up their lives. There are SADD chapters across the na-

tion and families are encouraged to start their own. The group uses social media for outreach, among other tools, and has Facebook and MySpace pages teens can join. It also Twitters.

Drug Abuse Resistance Education (D.A.R.E.)

Los Angeles, CA

www.dare.org

This police officer-led program is used by the majority of school systems in the U.S. as their primary method of drug and alcohol prevention. D.A.R.E. teaches strategies to help children resist peer pressure and avoid drugs, alcohol and cyber bullying among other problems. A new curriculum is aimed at middle school students and teachers.

The Century Council

Arlington, VA

www.centurycouncil.org

Sixty-five percent of kids who drink get the alcohol from family or friends. This group, funded by distillers, focuses on explaining the civil and criminal liabilities related to social hosting and/or providing alcohol to underage youth. With the International Institute for Alcohol Awareness, it sponsors Not in Our House, a Web site and print materials at www.centurycouncil.org.

Science and Middle School Educators

The American Association for the Advancement of Science

Washington, DC

www.aaas.org

AAAS is deeply involved in explaining many aspects of science to the general public. Over the past decade, it has developed products in print and electronic media for parents and other audiences explaining the science of subjects such as chronic illnesses, learning, and global warming. Middle and high school students can sign up for podcasts on cool science.

www.scienceupdate.com/index.php

National Middle School Association (NMSA)

Westerville, OH

www.nmsa.org

If you want to learn more about middle school teachers and curriculum, the NMSA can help. Its Month of the Young Adolescent, held every October, has multiple opportunities for parents and their kids' schools to get involved. A sub-group, the National Middle School Science Teachers' Association just launched a blog that may be useful in better understanding science and health curriculum.

nmlsta.blogspot.com/



Society for Neuroscience

Washington, DC

www.sfn.org

If you want to learn about brain research and the effects of alcohol on kids this is the place to go. The *Brain Briefings* newsletter discusses current research in language a middle school student can understand. Here is a link to an issue on the adolescent brain: www.sfn.org/index.aspx?pagename=brainBriefings_main



For Kids

The Cool Spot

Washington, DC

www.thecoolspot.gov

Created for kids ages 11 to 13 by the NIAAA, the site, which is colorful and uses cartoon drawings of kids to get its points across, has a lot of good, clearly written information for kids. There is a section for teens to tell their stories and a continual bell sound.

KidsHealth.org

www.kidshealth.org

If you're looking for information you can trust about kids and teens that's free of "doctor speak," you've come to the right place. KidsHealth is a general health site that includes valuable information for younger children and teens about alcohol and science.

Discovery Channel Mythbusters

<http://dsc.discovery.com/games-quizzes/alcohol-myths/>

Both print and video are available from Discovery Communications on alcohol myths and they all address the science of how alcohol affects the human body.

NIDA for Teens

<http://teens.drugabuse.gov/index.php>

This site has some good general information on addiction and the effects of drugs on the human body but very little specifically on alcohol. It contains elements such as a glossary of drug terms – you'll be happy to know it uses the term Mary Jane – but is also good for learning with your child. The site has a lot of science and good explanations of it, so it can be helpful with that.

YouTube

www.youtube.com

Our kids go to this site all the time. Videos on alcohol and science range from drunk teens making films with a handheld to videos made by middle school students on this topic for class projects. The best resource for kid-friendly videos is our project's Facebook page. We have reviewed all of them.

www.facebook.com/pages/Science-Inside-Alcohol/33451484521

Other Sites of Interest

Alcohol Information Center

www.alcoholinformation.org

Potsdam professor emeritus David Hanson, an alcohol researcher with decades of experience, runs a site called Alcohol Problems and Solutions. This is his private site which includes information on alcohol issues, and drinking and driving, as well as youth and alcohol.

WebMD

www.webmd.com

This site offers a very thorough information guide for parents. It's straight text but explores and explains a variety of alcohol related illnesses and effects. It also offers advice for parents on how to identify if their child is drinking and how to find treatment facilities.

Science NetLinks

www.sciencenetlinks.com/lessons.php?BenchmarkID=7&DocID=510

A site sponsored by Verizon and other organizations, it has both K-12 and after school lessons posted. Parents will find it helpful to review lessons and teaching guides as well as hands-on activities to help kids grasp new ideas. The science curriculum includes teaching guides on The Science Inside Alcohol.

