

### INTRODUCTION

Most teenagers are familiar with the highly publicized risks of drinking alcohol, including accidental injury, drunk-driving crashes, and alcohol poisoning. But when it comes to the effects of alcohol on the body, most teens don't seem concerned. After all, cirrhosis of the liver and heart disease are things that happen to people in their fifties and sixties.

Now, cutting-edge research being conducted across the country is challenging that way of thinking. According to new studies, alcohol can do serious and immediate harm to a teenager's brain. In fact, adolescents who drink face an even higher risk of brain impairment than their adult counterparts.

What does "brain impairment" mean? It appears that alcohol causes a decrease in the ability to learn new information, form memories, and perform cognitive functions. These effects are fairly immediate, occurring only hours after drinking. A new theory is now emerging to explain the cause of this impairment. Intoxication causes brain activity to slow down. Some scientists believe that the body tries to compensate by increasing the activity of neurons. This causes overstimulation, especially as the drinker enters withdrawal, or the hangover phase. Many of the overstimulated cells actually break down in their own membranes and die.

Not surprisingly, large amounts of alcohol often produce greater amounts of impairment. But a young person doesn't have to be blindly intoxicated to be harmed. In one study, young people ages 21 to 24 were given enough alcohol to raise their blood-alcohol level slightly below the generally accepted legal limit of 0.08 percent, or an amount sufficient to produce a "buzz." People ages 25 to 29 were given equal doses. After both groups performed simple cognitive tests, the younger group showed 25 percent more impairment than the older group. Even though researchers knew that the brain develops well into the twenties, they were shocked to see such a large difference in impairment across such a small age gap.

Other studies have recorded brain scans of teenagers who drink versus teens who do not. On average, the hippocampus of a young drinker was 10% smaller than that of a non-drinker. The hippocampus is the area of the brain involved in learning and memory. In addition, brain scans of young women who drink showed larger regions of sluggish mental activity compared with young women who did not drink.

The startling evidence of this and other studies is presented in the video *Brain Scans: Alcohol and the Teenage Brain*. As the research is described, real teenagers share their personal views about alcohol. Their beliefs and the emerging evidence are often at odds with one another, providing ample opportunities for further learning and discussion.

## BRAIN SCANS: ALCOHOL AND THE TEENAGE BRAIN

### LEARNING OBJECTIVES

After viewing the videotape *Brain Scans: Alcohol and the Teenage Brain* and participating in class activities and discussions, your students should be able to:

- understand that alcohol presents special risks for young drinkers
- recognize the short-term and long-term effects of alcohol on the brain
- understand new research exposing a link between teen drinking and impaired brain function
- discuss and explain important information on the other health risks of alcohol
- learn skills for avoiding peer pressure to drink alcohol
- identify and appreciate alternative drug-free hobbies and interests
- explore activities that promote healthy development of the brain
- separate the facts about alcohol from commonly believed myths
- understand how the effects of heavy drinking may affect them personally
- discuss the various effects of binge drinking on the mind and body