

## **The Effects of Substance Use and TBI**

### **1. How does substance abuse affect a person who has had a traumatic brain injury?**

There are multiple reasons why alcohol and other drug use after traumatic brain injury is not recommended. The substance abuse education series "User's Manual for Faster, More Reliable Operation of a Brain after Injury" (Ohio Valley Center, 1994) enumerates eight reasons:

1. People who use alcohol or other drugs after they have a brain injury don't recover as much
2. Brain injuries cause problems in balance, walking or talking that get worse when a person uses alcohol or other drugs.
3. People who have had a brain injury often say or do things without thinking first, a problem that is made worse by using alcohol and other drugs.
4. Brain injuries cause problems with thinking, like concentration or memory, and using alcohol or other drugs makes these problems worse.
5. After brain injury, alcohol and other drugs have a more powerful effect.
6. People who have had a brain injury are more likely to have times that they feel low or depressed and drinking alcohol and getting high on other drugs makes this worse.
7. After a brain injury, drinking alcohol or using other drugs can cause a seizure.
8. People who drink alcohol or use other drugs after a brain injury are more likely to have another brain injury.

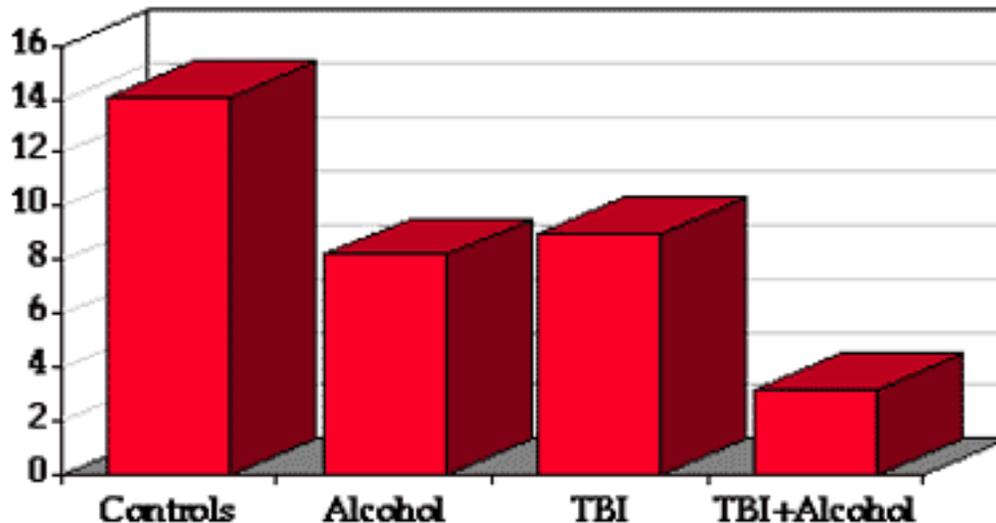
### **2. How is the brain affected?**

There is mounting evidence about the adverse effects of alcohol and other drug use after traumatic brain injury. Several studies have observed an association between use and such unwanted outcomes as unemployment, living alone and feeling isolated, criminal activity and lower life satisfaction (Sherer et al., 1999; Corrigan et al., 1997; Kreutzer et al., 1996; Kreutzer et al., 1991; Corrigan et al., 2003). While these studies have observed associations, the causal links or processes have not been fully explained.

There are also studies suggesting an "additive effect" on brain structure and function for substance abuse and traumatic brain injury (Barker et al., 1999; Baguley et al., 1997; Bigler et al., 1996). One example is the study by Ian Baguley and colleagues from Australia (see graph below). Their 1997 study of event-related evoked potentials (an indication of how fast the

brain detects new stimuli) showed a clear additive effect of heavy social drinking and traumatic brain injury requiring hospitalization. Those subjects who had either of these conditions were slower responding than people with neither; and those with both were slower still.

## P300 Amplitude



### 3. How much alcohol or other drugs is it safe to consume after brain injury?

The answer to this question requires multiple considerations. First, there are many reasons why it is not safe to consume illegal drugs, including their interactions with prescribed drugs or other medical conditions, the potential for being arrested, the proven greater vulnerability to injury or being victimized, and last but not least the potential for additional brain damage from these uncontrolled substances.

Alcohol – because it is a legal substance for adults – presents a more complex question. Our starting point is that certainly no one should consume more alcohol after traumatic brain injury than would be considered safe for an adult who had not. Many people do not realize that for adult men under age 65 it is recommended that no more than two alcoholic drinks should be consumed each day. For men over age 65 and for women, the recommended maximum is one drink per day (reference NIAAA website).

So the question becomes after traumatic brain injury should an individual drink even these amounts? Based on information about how alcohol and traumatic brain injury add together to change brain structure and function, we believe that there is no safe amount. We suspect that especially during the early period of recovery – the first several years when the brain is attempting to spontaneously heal and otherwise accommodate the injury – alcohol can inhibit these natural processes.