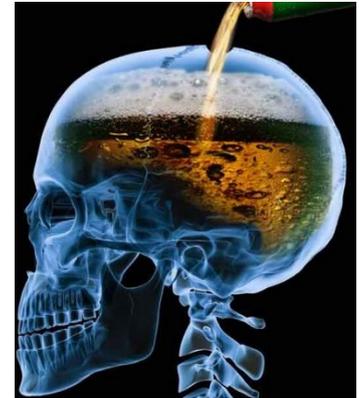


## Alcohol and the Brain

Alcohol is the most widely used and abused drug on the planet. Most of us have experienced first hand or witnessed the effects of too much alcohol, and for many people, drinking alcohol is a habit that is as normal as waking up in the morning.

What many of us are not aware of are the short and long term effects of alcohol on the brain. Why do people get louder, more excitable and let their inhibitions slip if alcohol is defined as a depressant? In addition, why do some people have blackouts and lose their memory after a drinking binge? Moreover, how do you define a binge?



### The Effects of Alcohol on the Brain

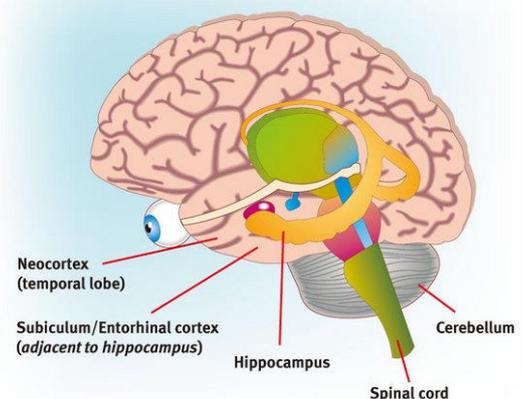


Slurred speech, dizziness, reduced inhibitions, inability to walk in a straight line, excitableness and drowsiness are all visible side effects of alcohol that demonstrate the brain is being affected. These signs soon disappear when the drinking stops and a person has had a chance to sober up. However, the more often the brain is subjected to alcohol in this way, the higher the risk of more permanent damage. The brain is a very sensitive organ, and the level of sensitivity varies from person to person. There are a number of variables which influence how a person will react to excessive alcohol intake. These include age,

gender, ethnicity, body size, general health, medication intake, and an individual's drinking habits. The effect of alcohol on the brain is largely determined by how the alcohol reacts with various neurotransmitters found in the brain. Neurotransmitters are chemicals which are involved in the transmission of signals from neurone to neurone or neurone to cell.

### Memory Loss

Some people report blacking out when they have drunk alcohol. A blackout can be described as a period of memory loss in which a person forgets what occurred over a period of time. Blackout usually occurs when an individual drinks too much too quickly, causing their blood alcohol to rise at an alarming rate. The parts of the brain associated with thinking and forming new memories are the hippocampus and the entorhinal cortex. With continued alcohol abuse, memory loss can become permanent.



### Alcohol – Upper or Downer?

People drink to get excitable and have fun don't they? So how come alcohol is described as a depressant? Well firstly, it is important to know that the term depressant in this circumstance refers to slowing down of the central nervous system. The truth is that alcohol is much more than simply a depressant. While an individual is in the process of drinking, alcohol acts as a stimulant.

As the level of alcohol in the blood rises, levels of norepinephrine also rise. Norepinephrine is also called noradrenalin. Norepinephrine is a neurotransmitter responsible for arousal. Many chemically manufactured 'uppers' affect levels of norepinephrine by various mechanisms. It is responsible for the lack of inhibitions and increase in impulsive behaviour of the intoxicated person. When a person's blood alcohol level begins to decrease, the individual will start to feel less energetic, drowsy and even depressed.

Norepinephrine is just one of many neurotransmitters that are altered with alcohol. Dopamine is a much better known and infamous one, commonly associated with narcotics. Alcohol intake indirectly stimulates dopamine release in some parts of the brain, mainly those involved in the reward pathway. The reward pathway is responsible for driving our motivation and is usually associated with feelings of pleasure.

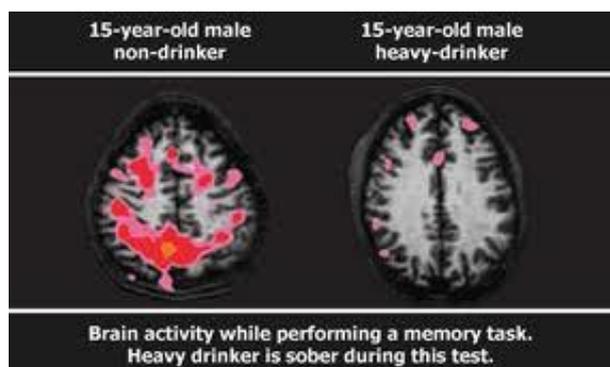
The reason alcohol is known as a depressant is because it also enhances the gamma aminobutyric acid (GABA) system. Gamma aminobutyric acid is a neurotransmitter which represses or slows down activity in the brain, causing a person to feel relaxed and drowsy. Alcohol is a very small and complex molecule which interacts with many more neurotransmitters and scientists continue to discover more about alcohol and its effect on the human body every day.

### Can't Walk Straight....

The cerebellum is the part of the brain involved in movement and coordination, including fine motor control. Alcohol affects the cerebellum and impairs neurone function in this area. Therefore, an intoxicated person may be wobbly, unbalanced, and unable to perform fine motor tasks such as writing or threading a needle. The more intoxicated the individual the worse their motor skills will be. In pregnant woman who consume alcohol, there is a risk that their babies will be born with an abnormally small cerebellum.



### Alcohol and the Developing Brain



Evidence suggests the brain continues to develop into the early twenties, and that excessive alcohol intake can cause irreversible damage to a young person's brain. The frontal lobes of the brain are related to major adult functions such as complex decision making and thought, and inhibition of more childlike, impulsive behaviour. The frontal lobes undergo critical stages of development during the teen and early adult years. Even in small doses, alcohol is linked to a reduction in inhibitory brain

processes. As these brain processes are underdeveloped in teenagers anyway, alcohol abuse is likely to increase the level of risk taking behaviour beyond what would be apparent in a fully developed adult. Early exposure to alcohol can also be related to the development of alcohol dependence later in life.

### The Limit

National guidelines developed by the National Health and Medical Research Council recommend no more than two standard drinks a day for healthy men and women. They also state that drinking no more than four standard drinks on a single occasion reduces the risk of alcohol related injury arising from that occasion. No more than two drinks should be consumed in the first half hour of drinking.



# STANDARD DRINKS

		<p><b>1.4</b> STANDARD DRINKS Champagne (150ml glass)</p> 	<p><b>1.4</b> STANDARD DRINKS Rekorderlig Premium Strawberry-Lime Cider (500ml bottle)</p> 
<p><b>1.3</b> STANDARD DRINKS Corona Extra beer (355ml bottle)</p> 	<p><b>1.0</b> STANDARD DRINKS Gin &amp; tonic (30ml spirit + 200ml diet tonic water)</p> 	<p><b>0.8</b> STANDARD DRINKS Hahn Premium Light beer (375ml bottle)</p> 	<p><b>1.5</b> STANDARD DRINKS Red wine (150ml glass)</p> 
<p><b>0.7</b> STANDARD DRINKS White-wine spritzer (150ml glass; 50% wine, 50% soda water)</p> 	<p><b>1.1</b> STANDARD DRINKS Smirnoff Ice Red Original Vodka (300ml bottle)</p> 	<p><b>0.8</b> STANDARD DRINKS Baileys on ice (60ml glass)</p> 	<p><b>1.3</b> STANDARD DRINKS Pure Blonde Premium low-carb beer (355ml bottle)</p> 

NB: Always read the label to check the bottle's number of standard drinks

There are controversial guidelines which will declare three glasses of wine with your dinner a binge drinking session.

There are many arguments for and against guidelines and legislation around drinking. However, what you cannot ignore is that the addition of a tiny chemical drastically alters brain function and ultimately behaviour and the damaging effects of alcohol on the brain and the body are only reversible for so long.

## LexiMed Consultants

- |   |  |   |
|---|--|---|
| <p>⌘ <b>Dr Leigh Atkinson</b><br/>Neurosurgeon</p>      | <p>⌘ <b>Dr John Baker</b><br/>Neurosurgeon</p>           | <p>⌘ <b>Dr Michael Redmond</b><br/>Neurosurgeon</p> |
| <p>⌘ <b>Dr Edward Ringrose</b><br/>General Physican</p> | <p>⌘ <b>Dr Matthew Rickard</b><br/>General Physician</p> | <p>⌘ <b>Dr Noel Saines</b><br/>Neurologist</p>      |

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