

# ALCOHOL AND THE ADULT BRAIN

By the time you reach adulthood, your brain is in its prime. It's doing things that scientists are still struggling to understand and at unbelievable speeds.

But still, even though the adult brain is the cleverest piece of 'kit' we will ever own, some people don't really 'mind' their brain – they don't actively think about keeping it healthy or safe.

Not many people are aware that drinking alcohol can have a big impact on the health of their brain and it can change the way your brain works permanently.

Most people have done something when they are drunk that they later regret. But what would happen if that action changed your life or brain forever?

Here are some facts.

## What happened? Looking in to blackouts

You wake up to your phone beeping furiously

*"Where did you go last night?"*

*"Where are you???"*

*"Did u get home OK"*

Instead of the usual swift response and details of the latest gossip...you're not quite sure what happened. In fact, you don't have a clue.

A lot of people might be familiar with this "morning-after-the-night-before" panic– those mornings when you draw blanks when you start thinking about the details of the previous night.

While often the butt of jokes, OMG moments and embarrassing regrets, black-outs can have a very dark side too.

While scientists won't be able to fill you in on the blanks of your night out - they can tell you what happens when you blackout while drinking.

## So, what did happen?

Blacking out is different than passing-out. During a blackout, the person is fully conscious – chatting, laughing - and may seem quite alert. Later though, they may be unable to recall any details of the event.

Black outs occur when an intoxicated person temporarily loses the ability to create new memories. This happens because of the way alcohol disrupts the memory center of the brain – the hippocampus.

The hippocampus acts a bit like your i-cloud. This part of your brain 'backs-up' information and events as they happen – it stores and organises memories so that you can remember things at a later point. It 'files' new information and memories so they can be easily found when you want to remember them again.

When you drink too much or too quickly– this automatic back-up of information and events doesn't happen like it usually does.

The rate at which your brain 'backs-up' information can begin to slow even after one or two drinks of alcohol. If you keep drinking, or drink too quickly, it can disrupt or completely block the ability to store memories for events that occur while you are intoxicated.

Just like a 'back-up failure' can lead to the loss of a few precious photos, or to the entire contents of your phone – your ability to recall memories after a blackout can vary.

### **Types of blackout**

Two forms of blackouts have been identified: *En bloc* (total) or *fragmented* (partial) memory lapses.

#### **En bloc blackouts**

Someone who experiences an *en bloc blackout* is unable to recall any information for large portions of their night out.

#### **Fragmentary blackouts**

The *fragmentary* blackout is a partial loss of memory after a drinking - you may remember bits and pieces of things, once you are reminded.

Regardless of which form of black-out you experience, both indicate that your brain is not coping with the amount of alcohol that is being consumed and they should not be taken lightly.

People who experience blackouts typically drink too much and too quickly and this causes their blood alcohol levels to rise very rapidly. This puts the person at risk of engaging in potentially dangerous behaviours while they are blacking-out. This includes risky sexual behaviours, driving while drunk or doing something reckless that could have fatal consequences for you or other people.

The bottom line is that if you are blacking-out, alcohol is effecting your brain in a very negative way. Blackouts – especially if they are happening frequently – are a sign that your alcohol use needs to change.

#### **KEY ADVICE**

- Reduce your risk of blacking out by drinking within the low risk guidelines.
- If you are drinking, avoid drinking too quickly – sip rather than gulp. Alternate alcoholic drinks with non-alcoholic drinks
- Eat up – never drink on an empty stomach
- Stay safe – if you are prone to alcohol-induced black outs, always avoid drinking in unfamiliar situations or where you are not surrounded by trusted people. Plan ahead how you are getting home and with whom.

In some cases, a night out on the town can lead to a serious and permanent disability in a matter of seconds.

In Ireland, alcohol features in the development of 1 in 4 traumatic brain injuries (TBI's). A TBI is when the brain becomes injured as a result of a fall, accident or assault.

Because of the way alcohol influences your brain, you are more at risk of being involved in one of these incidents if you have been drinking.

This occurs because of the way alcohol interrupts the normal 'protective' behaviours of the brain. Just think about it – as you grow from childhood to adulthood you become more and more able to move around the world in a safe way without bumping into things or falling over. You avoid things that put you in danger and react quickly if there is a risk around you.

Even after one or more drinks though, your ability to do this begins to change. For example your hand-eye coordination is reduced, making you more susceptible to accidents or falls. It can cause your thinking to become 'hazy' and slow your reaction times to danger around you e.g. getting out the way of an approaching car.

Did you know what 1 in 3 pedestrians killed on Irish roads had alcohol in their system?

Alcohol also causes a part of brain responsible for controlling and understanding behaviour – the frontal lobe- to gradually shut down. When this happens, you are more likely to misunderstand the actions of others when you are drinking. You are more likely "to take things the wrong way".

This is a double-edged sword because drinking alcohol can also make you more likely act on strong emotions such as anger or sadness. Because the control centre of the brain is not working properly, it can cause you to lash out at people or say and do things that you later regret. In some cases, this leads to assaults or drunken brawls which can lead to injuries of the brain and disability.

For every traumatic brain injury death in Ireland at least two people survive with a permanent disability.

#### KEY ADVICE

- Reduce your risk of TBI by drinking within the low risk guidelines.
- If you have been drinking a lot, book a taxi – do not attempt to walk home alone. Avoid using the stairs and sleep in a downstairs bedroom
- Cool down – step away from arguments, encourage your friends to do this too – use your brain not your fists
- Seek medical attention if you or a friend falls while they are drinking, especially if they have hit their head – the effects of a brain injury may not always be immediately obvious.

A stroke happens when the blood supply to the brain is disrupted or when a blood vessel within the skull bursts and bleeds into and around the brain.

These 'brain attacks' can cause damage to important parts of the brain.

Research shows that drinking too much alcohol can increase your risk of having a stroke. Why? Because alcohol contributes to a number of medical conditions that are risk factors for stroke.

These include

- High blood pressure - Drinking too much alcohol can cause high blood pressure. High blood pressure is responsible for nearly half of all strokes.
- Diabetes: Drinking alcohol changes the way your body responds to insulin. Having diabetes doubles your risk of having a stroke.
- Being overweight or obese: Alcoholic drinks are high in calories and can contribute to weight gain which in turn increases the risk of having a stroke
- Irregular heartbeat: Drinking too much alcohol can lead to a pattern of irregular heartbeats known as atrial fibrillation. Having atrial fibrillation increases your risk of stroke up to five times.

#### KEY ADVICE

- Everybody can reduce their risk of having a stroke by making important lifestyle changes. These involve changes such as having a healthy diet, exercising regularly and stopping smoking. Cutting down on the amount of alcohol you drink by following the low risk guidelines will also help you reduce this risk.

## Alcohol-Related Brain Injury

*My brother had everything going for him – a good job, a nice girlfriend, a lovely home.*

*He started drinking too much when he moved abroad for work.*

*It became a big problem for him over the years until eventually he lost everything because of it. We didn't know how bad things had got until he ended up in hospital. He couldn't walk, he was confused, and he'd lost so much weight. He couldn't remember our parents had died years ago and he was wondering why they weren't there.*

*He got a lot better with the right rehabilitation but still has problems with his memory. He needs a lot of support for it. He can't go back to work and he needs people to help with basic things.*

*While he is happy, we sometimes wonder how life would have been for him if he hadn't developed an Alcohol-Related Brain Injury when he was 48.*

*Family member*

Drinking large amounts of alcohol over long period of time can also cause the development of what is known as an Alcohol-Related Brain Injury.

This type of brain injury is a bit different. There is no accident or fall involved. It usually develops slowly over time or it can develop quite suddenly.

If a person has been drinking large amounts of alcohol for long periods of time, the toxic properties of the alcohol can begin to damage the brain. The brain can also become dehydrated or short on important vitamins.

As a result, the brain begins to change. Certain parts of the brain can become damaged causing a person to develop an Alcohol-Related Brain Injury (ARBI).

This brain injury can cause changes in memory, thinking skills and other important brain-based skills such as concentration, problem solving and reasoning/judgement.

These changes can be subtle or they can be more severe and can impact people in different ways.

When the brain injury is mild, a person may notice only small changes in their memory. This can sometimes be put down to normal ageing but the change has its roots in alcohol consumption.

More severe forms can cause a person to have major difficulties with their memory leading them to need support from carers throughout their lives. They may struggle 'updating' their memory as time passes and cause them to have difficulties keeping up with the normal passage of life. They may experience changes in their personality.

Despite all of these changes, they may not notice that these changes have occurred and not see any reason to change their drinking and they may be reluctant to seek or accept help. They may have difficulty making good decisions leading their situation to become worse over time.

## Types of Alcohol-Related Brain Injury

Alcohol-Related Brain Injury can take many forms but it can be broken down into mainly two types - *acute* forms and *chronic* forms.

Acute forms come on very rapidly and are considered medical emergencies. The most common type is *Wernicke's Encephalopathy*.

Did you Know?

**163** people were admitted to hospitals in Donegal, Sligo, Leitrim and Roscommon with an Alcohol-Related Brain injury between 2005 and 2009

**Wernicke's Encephalopathy** results from a severe lack of Vitamin B1 (or thiamine). People who are drinking very heavily often neglect their diet and as a result become deficient in important vitamins for their brain.

If this happens, they may develop memory problems or confusion, rapid jerking movements in their eyes (sometimes called 'dancing eyes') and poor balance and coordination. Wernicke's Encephalopathy is a medical emergency and requires immediate medical help. 20% of people who develop WE will die from their condition and 80% of people who survive will develop a *chronic* form of Alcohol-Related Brain Injury.

Chronic forms of Alcohol-Related Brain Injury may develop more slowly over time and are usually long lasting. These include

**Korsakoffs Amnesic Syndrome:** This disorder can cause problems with learning new information. It can lead to an inability to remember recent events. As time passes, a person may have little memory of things that have happened over many years.

**Frontal Lobe Dysfunction:** This disorder leads to difficulties with problem solving and motivation behaviour. They may be unable to solve problems or to 'get started' on important tasks even simple ones. They may have difficulties controlling behaviour and experience frequent mood changes.