



ALCOHOL
and you

STRESS, TRAUMA AND YOUR BRAIN

Some stress is part of everyday life, but.... Excessive stress can be overwhelming and complicated by events from our past. It may be helpful to know how anyone's brain responds to stress. This may be a bit complicated so we tried to put the basics for you in this paper. We believe it's important to support your recovery.

→ Stress

Anyone's stress response kicks in when they perceive they are under threat. This is a remarkable system that has helped human beings survive through evolution.

In today's world a range of things can be perceived as threatening. What happens in your body when you feel threatened? Stress chemicals are released that means



Your heart beats faster

Your blood pressure increases

You breathe faster

Oxygen goes to your muscles

Your liver releases more sugar into your blood ready for action

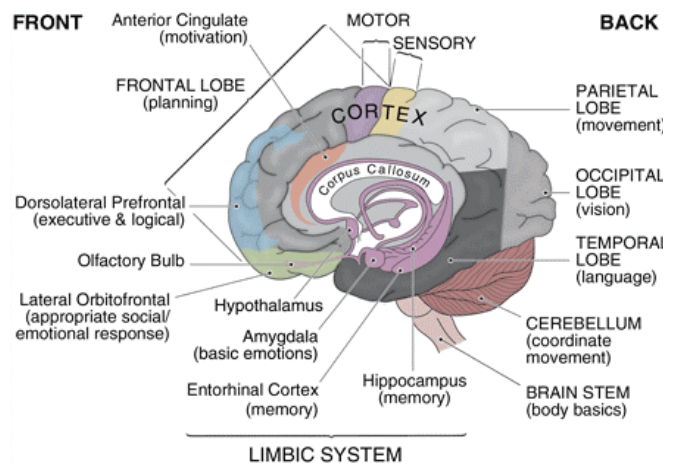
Before we look at how the brain works let's look at the three stress hormones:

Adrenaline, Cortisol and Norepinephrine:

Adrenaline increases the amount of sugar in your blood, increases your heart rate and raises your blood pressure and gives you a surge of energy

Cortisol produced by the adrenal glands influences many of the changes in the body in response to stress including blood sugar (glucose) levels

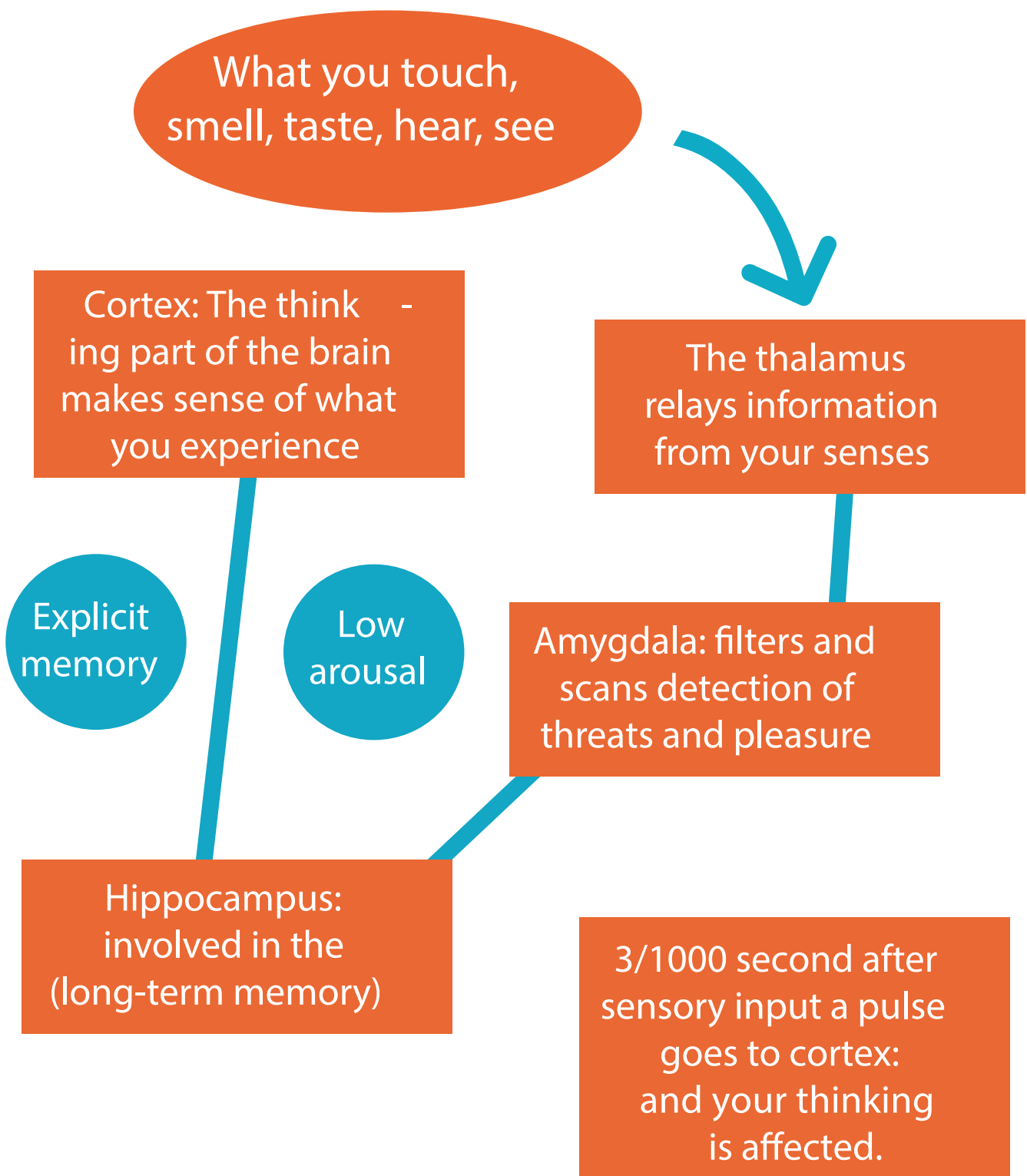
Norepinephrine makes you more aware, awake, focused and shifts blood flow away from areas of your body to your large muscles.



So how do our brains tend to work? Have a look at the diagram on the next page

→ How different parts of the brain work together in normal circumstances

Our senses take in what we experience. The thalamus relays that information and the amygdala filters for danger. If non-threatening memory and the thinking part of our brain kicks in:



→ How does it work when we feel threatened?

Our senses take in what we experience. It may be threatening in the here and now but it also may remind us of what was threatening from our past.

What you touch,
smell taste, hear, see

Explicit
memory

Stress hormones
suppresses cortex
functioning.
The thinking part
of the brain

The thalamus
relays information
from your senses

Amygdala: filters and
scans detection of
threats and pleasure:
Danger, Danger
You don't have to
think. The body's
reaction is automatic

Hippocampus:
involved in the
(long-term memory)

High
arousal

Hypothalamus:
regulates body
functions including
the release of stress
hormones

Chemical
release

The remarkable thing about the human brain is how it is built for survival. The Amygdala filters for danger. It is not concerned about medium or long term things. It's about what is needed immediately to keep you safe.

This is linked to two things:

- **Your immediate personal safety**
- **Your attachments**

But don't we just "**think things through**"? Well maybe not. The Cortex is the thinking part of the brain and is slow to develop.

- The thinking part of our brain will have very rapid growth between the ages of 6 months to three years.
- There is steady growth until the early teenage years, then another spurt, then more steady growth until you are about 25.
- It used to be thought that development of this part of the brain stopped at 25. Now it is believed there is a small continued development until you are about 40.

Chemicals that are there to help deal with that immediate danger can suppress the thinking part of the brain.



Experience will result in our brains being wired to respond in a certain way.

As the diagram shows, when we experience danger the chemicals that are there to help deal with that immediate danger can suppress the thinking part of the brain. These chemicals send blood and most importantly oxygen from our brain and other parts of the body to our large muscles to respond to that danger.



What happens when we live with a lot of danger or have experienced it in our past? Our implicit memory, those thoughts that lie underneath the service can trigger that natural, instinctive response for survival.



Along the way you may have learned (well into that implicit memory) that using alcohol or drugs (or some other unhealthy way to self soothe) is an automatic response for an immediate "solution" to those unsettling experiences.



Many people often use a range of unhealthy ways to self soothe like alcohol, drugs, eating and shopping.

ARE YOUR WAYS TO SELF SOOTHE
HELPING OR HURTING YOU?

→ There are defences to this danger that can be learned over time

Active defences:

Friend : social engagement "be my friend"
Fight : no you won't

Passive defences:

Flight : run away
Freeze : tense up
Flop : being passive

A worrying thing is when active defences don't work they often get weakened.

It's like the amygdala has a memory of its own. "That was not a good idea I will resort to what I used to doing is based on it working in the past"

am

As you read this can you relate to a time your automatic response to stress or danger was to, avoid it?

Are you are passive to it or seem to just give in? That may be a learned "flop" type defence and reaching for drink or drugs to self soothe seems automatic.

Does excessive stress change the brain?

- In the short-term the chemicals like cortisol help the brain to cope with threatening situations.
- Chronic stress increases activity among neural connections in the amygdala which means higher levels of cortisol.
- Increased cortisol can cause electric signals to deteriorate in the hippocampus which regulates memory and emotions. This weakens a person's ability to control stress.
- It can hard-wire pathways between the hippocampus and amygdala in a way that the brain that is predisposed to be in a constant state of fight-or-flight.
- It also has the ability to flip a switch in cells that inhibits connections to the prefrontal cortex, the thinking part of our brain.

The amygdala is focused on what is immediate not medium of long term

That means stress here and now and also from our past can be having more of an affect that you realize.

But that's not the end of the story. There are things you can do to help yourself.

→ What science is saying: Understanding our brains and nervous system?

Our brains are made of two things: grey matter and white matter.

- The "**grey matter**" of the brain is densely packed with nerve cells and is responsible for the brain's higher functions, such as thinking and decision-making. Grey matter is only half of the brain matter inside our heads. The other half of brain is white matter.
- The "**white matter**" are a network of fibres (axons) that interconnect nerve cells (neurons) and create a communications network between different areas of the brain. White matter gets its name from the white, fatty myelin sheath that surrounds the axons and speeds the flow of electrical signals between neurons and parts of the brain.



As we grow older neural pathways form superhighways of nerve cells that transmit messages. When messages travel over these superhighways many times, the pathway becomes more and more solid. Think of it like a set of Christmas tree lights that light up in automatically. Chronic stress and habits will create certain solid pathways. That is why our reactions to things may seem "automatic".

There is some good news about all this. Research has shown that we can actively affect how our brains work and we can rewire our brains to create new pathways. Positive mental activity can change neural structure, since "neurons that fire together, wire together." The brain's well-known negativity bias -- like Velcro for the bad and Teflon for the good means making these changes takes sustained and deliberate effort. It won't happen overnight but you can strengthen more positive neural traits and pathways if you work at it.



→ Getting support

As said previously in this fact sheet stress can be a part of everyday life.

We can think of stress in 3 levels.

- Manageable stress: Those everyday pressures that we have the resources to deal with.
- Tolerable Stress: Ongoing stress that builds up
- Toxic Stress – Corrosive stress that you have no one to turn to.



Toxic stress and even tolerable stress can mean we have high levels of stress hormones running through our bodies. Living with toxic stress in childhood known as Adverse Childhood Experiences (ACE's) can have a lasting impact on anyone's physical and mental health well into adulthood.

Living with ACE's in childhood is not predictive. It will not mean you will go on to have problems.

Resilience, the capacity to be stressed and bounce back can make a difference. What science now knows is resilience can be strengthened at any age.

What are the building blocks of resilience?

- A stable person in your life
- Feeling you can overcome hardships and guide your destiny
- Feeling equipped to manage your behaviour and emotion
- Being involved and feeling connected

The next fact sheet “Stress, Trauma and Your Brain ideas for healing” will focus on strategies to strengthen resilience.

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