

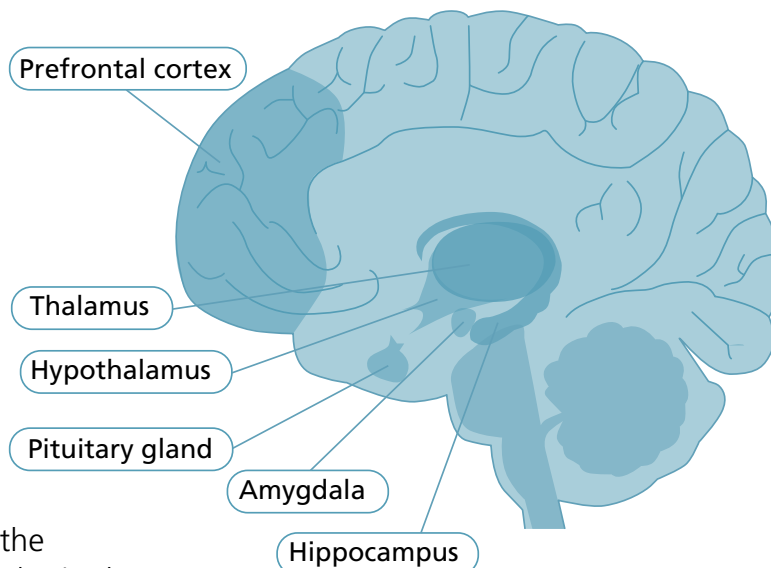
It can be helpful to understand how the brain and body react to trauma so that we can make sense of our reactions. When we are faced with a stressful event, our minds and bodies react automatically to respond to the threat, so that we can protect ourselves from the danger and survive. These are biological and physiological threat responses that are often not under our conscious control but are the natural ways we react to danger.

## What is going on in the brain?

There are three main parts of the brain involved in perceiving and responding to stressful events in our environment.

The **thalamus** is the part of the brain that orientates us to our surroundings. When something feels frightening or out of the ordinary we need to check this out further to establish how to respond.

A signal is sent to the **amygdala** which is the brain's 'alarm centre'. This is the part of the brain that responds to threat. It prepares the body by releasing stress hormones (adrenaline, cortisol) which helps prepare for the fight/ flight/ freeze response in the body.



**Fight / Flight:** The body automatically mobilises to prepare to fight or to run away. Our muscles tense. We take in more oxygen to fuel an increase in our heart rate so that you are ready for action and can make rapid decisions. Our digestive systems shut down as this is not an essential function in the face of threat. We will feel irritation / anger / rage (fight) or unease / anxiety / panic (flight).

**Freeze:** If we are unable to run away or to fight, we will immobilise and freeze to deter predators. You may feel numb and shut off from your feelings and dissociate from what is happening around you.

The **hippocampus** is the part of the brain where memories are processed and sorted to be stored. It creates a timestamp for our memories so that when we look back at things that have happened, we know what we did and when. When it receives signals from the amygdala, it checks out the threat by comparing it to past memories of similar situations.

The **pre-frontal cortex** is the area in the brain where we are able to think through and plan our responses. It enables us to understand our emotional reactions and control impulses.

## How does this impact people who have experienced traumatic events?

For people who have experienced extreme or long lasting trauma, the amygdala becomes very sensitive to help protect us from possible danger. This means it is constantly sending signals to release stress hormones so that the person will experience fight/ flight/ freeze as an automatic response to protect them from their perceived threats in their environment.



Trauma memories become disorganised because there was no time to process them and order them at the time of the trauma in the hippocampus. The memory stays as a sensory memory in the amygdala, not linked to the time and place of where it occurred. The brain remembers how frightening the danger was at the time of the traumatic event. Therefore if anything triggers a memory of the traumatic event the body prepares itself for danger. This means it reacts to small triggers as if they were serious dangers or to things that are reminders of things that have happened in the past even if there is no actual danger in the present.

The pre-frontal cortex can become underdeveloped when there has been chronic stress, meaning that people may struggle to rationally think things through and understand their emotions. This can lead to difficulties regulating emotions and acting impulsively.

Many people who have experienced traumatic events in their lives often also live with chronic pain and physical health problems. Sometimes this may also be linked to the abuse or trauma they have suffered. Being regularly flooded with stress hormones can also lead to these difficulties and impair our immune systems and ability to recover from infection as our bodies are constantly in a state of toxic stress. People might try different ways to cope with or distract from these feelings, including smoking, drugs and alcohol which may further impact on physical health.

## What can help?

- Developing an awareness and understanding of what is going on in our bodies as a fear response.
- When we notice this in our body, we can do things to soothe us and to help us relax. This might include progressive muscle relaxation, breathing exercises or yoga.
- Talking about the fear and feeling connected to others can also help.
- Continuing to engage in activities and things you enjoy, even when you don't feel like it.
- Having a focus on looking after our bodies, getting enough sleep, eating well and exercising. This is really important as our diet and sleep can also impact on the amygdala's sensitivity to threat.

*'Trauma victims cannot recover until they become familiar with and befriend the sensations in their bodies. Being frightened means that you live in a body that is always on guard. Angry people live in angry bodies. The bodies of child-abuse victims are tense and defensive until they find a way to relax and feel safe. In order to change, people need to become aware of their sensations and the way that their bodies interact with the world around them. Physical self-awareness is the first step in releasing the tyranny of the past'* (Bessel Van Der Kolk, 2014, p.100-101).

## Further reading:

- Haines, S. (2016). *Trauma is really strange*. London: Jessica Kingsley Publishers  
 Herman, J (1997). *Trauma and Recovery*. New York: Basic Books  
 Van der Kolk, B. (2014). *The body keeps the score*. London: Penguin Books