Trauma and the Brain

This is a very simplistic explanation of a very complex process. There are three main parts of the brain which are greatly affected by experiencing severe or chronic traumatic events.

Hippocampus

- The hippocampus processes trauma memories, by recycling the memory, mostly at night via dreams, which takes place over weeks or months. It then transfers the integrated stored memory to another part of the brain. High levels of stress hormones causes the hippocampus to shrink or under-develop, resulting in impaired function. Childhood trauma exaggerates this effect. The trauma memory therefore remains unprocessed in the hippocampus, disintegrated, fragmented, and feels 'current' rather than in the past. (Some people may be born with a smaller hippocampus making them more vulnerable to develop PTSD.)

Amygdala

- The brain's 'fear centre'. The amygdala helps to store memories, particularly emotions and physical sensations. It also controls activation of stress hormones – the body's fight or flight response. In PTSD, the amygdala becomes over-reactive causing frequent or near constant high levels of stress hormones.

Pre-frontal cortex

- The pre-frontal cortex helps us to assess threats, manage emotion, plan responses, and control impulses. It is the centre of rational thinking. Childhood trauma causes under-development of the pre-frontal cortex, which results in impaired ability to assess threat through rational thinking, manage emotions and control impulses.

PTSD

Current triggers

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Hippocampus recalls part of fragmented and disintegrated memory – thought, image etc

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Amygdala reacts – emotional and body memory reactivated – 'flashback' re-experiencing of event. Interprets as current threat – emergency - stress hormones – fight / flight response

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Pre-frontal cortex unable to rationalise or determine that situation is not a current threat and therefore safe. Difficulty in managing emotions or controlling impulses

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Attempts to escape or avoid distressing memories and feelings mean the memory is never processed, so symptoms remain