

# 3 Ways Emotional Trauma Changes the Brain



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## What Happens in the Brain During a Trauma Response?

- The hypothalamus takes in information from our senses.
- The amygdala receives the sensory information and determines if a threat is present.
- If the information is perceived as threatening, several things happen simultaneously in the brain and the body:
  - We experience an increase in adrenaline.
  - The adrenaline shuts off the prefrontal cortex to conserve energy.
  - The hippocampus abandons its normal function of encoding logical information to long-term memory.
  - Instead, the hippocampus begins producing cortisol (a pain-reducing chemical).
  - If this happens often over long periods of time, the structure of the brain can be altered.



## How Does Trauma Alter the Brain?

The amygdala is bigger in brains that experienced ongoing trauma (Geotakes, 2020).

**Clinical View:** Information from the outside world is interpreted as dangerous more frequently.



Less activity in the frontal lobe, anterior cingulate and thalamic areas.

**Clinical View:** Lower activity in these areas of the brain makes it difficult to integrate old and new information in an adaptive way. This may be a factor in why individuals who have experienced pervasive trauma experience shame and blame themselves for their experiences (Geotakes, 2020).



The hippocampus and orbitofrontal cortex are damaged which makes it difficult to encode information such as cognitive and autobiographical memory.

**Clinical View:** This can cause memories to be dissociated from the prefrontal cortex. Additionally, it may impact how someone expresses affect/emotions due to a disconnect of affective circuits. Translation: Someone experiencing fear may not appear fearful (Geotakes, 2020).



## The Good News

These changes to the brain do not have to be permanent. Research indicates that Eye Movement Desensitization and Reprocessing (EMDR) Therapy can heal the brain and reverse the effects of trauma on the structure of the brain (Shapiro, 2017).

### References:

1. Giotakos, O. (2020). Neurobiology of emotional trauma. *Psychoaatriki*, 31(2), 162-171.
2. Shapiro, F. (2017). *Eye movement desensitization and reprocessing (Emdr) therapy, third edition: Basic principles, protocols, and procedures*. Guilford Publications.