



# POST-TRAUMATIC STRESS DISORDER Factsheet

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## What is MRI?

The technology of structural magnetic resonance imaging (MRI) is based on the magnetisation properties of cellular protons. The application of a strong magnetic field causes the protons within cells to shift direction, which will return to their original position over time (“precession”). The rate of precession differs across tissue types (such as grey matter and white matter in the brain), which can be interpreted by specialised programs to represent a 3D image.

## What is the evidence for changes in brain volume in people with PTSD?

Moderate quality evidence found small to medium-sized reductions in total brain volume, intracranial volume, left insula, right insula, total insula, superior frontal gyrus, left middle temporal gyrus, inferior temporal gyrus, left anterior cingulate, total anterior cingulate, rostral anterior cingulate, lateral orbitofrontal cortex total amygdala, left hippocampus, right hippocampus, and total hippocampus in people with PTSD compared to controls.

Moderate to low quality evidence found medium-sized effects of reduced hippocampus volume and large effects of reduced amygdala volume in people with PTSD who were exposed to childhood abuse compared to controls.

Moderate quality evidence found small to medium-sized reductions in grey matter, cerebral volume, temporal lobe, hippocampus, and vermis in children with PTSD compared to controls. There were also non-significant, small reductions in the amygdala.

Moderate to low quality evidence found increased PTSD symptom severity was significantly associated with decreased volume of the left, but not the right, hippocampus.

Compared to people with major depressive disorder, people with PTSD had reduced total brain volume and increased thalamus volume. Both PTSD and depression patients had significantly smaller hippocampal volume compared with controls, with no difference between the patient groups in this brain region.

For more information see the technical table



*NeuRA (Neuroscience Research Australia) is one of the largest independent medical and clinical research institutes in Australia and an international leader in neurological research.*

*Diseases of the brain and nervous system pose the greatest health, economic and social burden of any disease group because they are chronic, debilitating and have no known cures.*

*Medical research is the cornerstone of efforts to advance the health and wellbeing of families and the community. Our dedicated scientists are focussed on transforming their research into significant and practical benefits for all patients.*

*While we hope you find this information useful, it is always important to discuss any questions about PTSD and its treatment with your doctor or other health care provider.*

## HOW YOUR SUPPORT HELPS

We are able to make significant advances due to the generosity of countless people. Your donation allows us to continue to work towards transforming lives. For information on how you can support our research, phone **1300 888 019** or make a secure donation at [neura.edu.au/donate](http://neura.edu.au/donate)