

# **The Connection Between Marijuana & Limbic Brain Damage**

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In a new study, researchers in Australia have found evidence that heavy marijuana abuse may lead to brain damage – specifically in regions associated with memory and emotion.

When the brains of 15 heavy cannabis users were compared to age and IQ matched non-cannabis-using controls, marijuana smokers demonstrated smaller volumes in the hippocampus and amygdala, but not in other key brain regions, indicating selective damage to the mediotemporal lobe. The participants selected demonstrated minimal co-existing psychiatric problems, as well as limited exposure to other drugs of abuse.

As components of the limbic system – also known as the ‘emotional brain’ – the hippocampus and amygdala are responsible for regulating a host of physiological functions, most notably those associated with episodic memory (memory of specific events), spatial memory (awareness of our surrounding environment), stress response, and endocrine control. Additional responsibilities include the regulation of sleep, dreaming, appetite, eating behavior, fear, anger, motivation, and social cognition.

Similarly, dysfunction of the limbic system has been implicated in a range of disease processes, including dementia, anxiety disorders, schizophrenia, and emotional affective disorders such as clinical depression and bipolar disorder. People who have sustained damage to the amygdala show a propensity towards anxiety-induced panic attacks, excessive risk taking, and stress-related physical complaints, while those suffering from hippocampal insult have troubles retaining information, forming new memories, and accessing old ones.

Perhaps not so coincidentally, many of the aforementioned neurological deficits have been associated with heavy marijuana use in previous studies, and are common complaints of those undergoing treatment for marijuana abuse and/or withdrawal. In the fifth edition of the DSM – the American Psychiatric Association’s Diagnostic and Statistical Manual of Mental Disorders – common symptoms following marijuana cessation include anxiety, depression, sleep disturbances, anger, irritability, appetite changes, and the physical manifestations of stress.