



## **Short Term Memory Loss with Marijuana**

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*What are the acute effects of marijuana use?*

Marijuana's damage to short-term memory seems to occur because THC alters the way in which information is processed by the hippocampus, a brain area responsible for memory formation. Laboratory rats treated with THC displayed the same reduced ability to perform tasks requiring short-term memory as other rats showed after nerve cells in their hippocampus were destroyed.<sup>65</sup> In addition, the THC-treated rats had the greatest difficulty with the tasks precisely during the time when the drug was interfering most with the normal functioning of cells in the hippocampus.

As people age, they normally lose neurons in the hippocampus, which decreases their ability to remember events. Chronic THC exposure may hasten the age-related loss of hippocampal neurons. In one series of studies, rats exposed to THC every day for 8 months (approximately 30 percent of their lifespan), when examined at 11 to 12 months of age, showed nerve cell loss equivalent to that of unexposed animals twice their age.<sup>66, 67, 68</sup>

<sup>65</sup>Budney, A.J.; Higgins, S.T.; Radonovich, K.J.; and Novy PL. Adding voucher-based incentives to coping skills and motivational enhancement improves outcomes during treatment for marijuana dependence. *J Consult Clin Psychol* 68(6):1051-1061, 2000.

<sup>66</sup>Landfield, P.W.; Cadwallader, L.B.; and Vinsant, S. Quantitative changes in hippocampal structure following long exposure to delta-9-tetrahydrocannabinol: Possible mediation of glucocorticoid systems. *Brain Res* 443(1-2):47-62, 1988.

<sup>67</sup>Eldridge, J.C.; Murphy, L.L.; and Landfield, P.W. Cannabinoids and the hippocampal glucocorticoid receptor: recent findings and possible significance. *Steroids* 56:226-230, 1991.

<sup>68</sup>Landfield, P.W.; Waymire, J.C.; and Lynch, G. Hippocampal aging and adrenocorticoids: quantitative correlations. *Science* 202:1098-1101, 1978.