Marijuana’s effects on the brain
Anandamide

THC
The neuron’s “volume control” dials down neuron activity when too strong.
Synaptic pruning

Image retrieved from: http://etec.cltt.ubc.ca/S10wiki/Brain-based_Learning

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Receptor binding in brain tissue

<table>
<thead>
<tr>
<th>Compound</th>
<th>Potency relative to THC</th>
</tr>
</thead>
<tbody>
<tr>
<td>(-)-Delta9-THC</td>
<td>1</td>
</tr>
<tr>
<td>Anandamide</td>
<td>.47*</td>
</tr>
</tbody>
</table>

*The affinity of anandamide for cannabinoid receptors ranges from about one-fourth to one-half that of THC. The differences depend on the cells or tissue that are tested and on the experimental conditions, such as the binding assay used.

THC vs. Anandamide

Hippocampus and Memory

Persistent cannabis users show neuropsychological decline from childhood to midlife

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The Dunedin Study

N = 1,037

Assessment ages

13 yrs  (Pre-initiation)  18 yrs  21 yrs  32 yrs  38 yrs

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Average IQ change

Never used: 99.8 to 100.6

MJ dependent 3+ yrs: **99.7 to 93.9**

Used, never diagnosed

Never used

Healthy non-user

Daily MJ user

A meta-analysis of 6 studies found an increased risk of psychotic outcome among those who used cannabis most frequently compared with non-users (Adjusted Odds Ratio: 2.09, 95% CI: 1.54-2.84).

**Association between cannabis use and schizoaffective disorder**

<table>
<thead>
<tr>
<th># Exposure</th>
<th># Cases</th>
<th>HR Crude</th>
<th>HR adjusted*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never used cannabis</td>
<td>39,978</td>
<td>47</td>
<td>1</td>
</tr>
<tr>
<td>Ever used cannabis</td>
<td>5,109</td>
<td>12</td>
<td>2.1 (1.1-3.8)</td>
</tr>
<tr>
<td>&gt;50 times</td>
<td>855</td>
<td>7</td>
<td>7.5 (3.4-16.7)</td>
</tr>
</tbody>
</table>

*Adjustments for: prior personality disorders at conscription, IQ, disturbed behavior in childhood, social adjustment, risky use of alcohol, smoking, early adulthood socioeconomic position, use of other drugs, brought up in a city. The category “Ever used cannabis” includes all individuals who reported cannabis use, including those who reported “>50 times”.

**Sources:** Griffith-Lendering, Addiction, 108(4), 733-740. Manrique-Garcia, BMC Psychiatry, 12, 112.
The evidence is consistent with the view that cannabis increases risk of psychotic outcomes independently of confounding and transient intoxication effects.