

HOW METHAMPHETAMINE AFFECTS THE BRAIN



1. Methamphetamine increases dopamine, the pleasure chemical

The main effect of methamphetamine is through the dopamine system. Dopamine is the brain chemical that makes us feel good. It is released when we engage in pleasant activities – sex, food, and drugs all cause a release of dopamine.

Methamphetamine artificially releases huge amounts of dopamine, so the brain is awash with it for several hours.

2. Dopamine increases mental health symptoms

High levels of dopamine have been associated with psychosis. This is why some people experience psychotic symptoms when they are intoxicated.

Because the brain releases most of its dopamine stores at once, it takes a few days to replenish them.

Low levels of dopamine have been associated with depression, so methamphetamine users can feel flat for a few days after use.

3. Damage to the dopamine system affects emotion regulation

The main dopamine pathways run through the frontal lobe and the limbic system.

The frontal lobe, specifically the prefrontal cortex, controls our thinking processes: planning, decision making and impulse control. The limbic system controls emotions, social behavior and memory.

The dopamine pathways through these two brain regions are crucial for proper functioning.

With frequent use of methamphetamine, the dopamine system ‘wears out’ and has trouble producing enough dopamine. This affects ability to think and regulate emotions.

4. Brain changes can last 12 months or more, but are recoverable

The changes in the dopamine system can last more than 12 months. During that time, users can feel flat, depressed and unmotivated, and have difficulty with higher order thinking processes like planning, concentration and decision making.

These functions appear to be recoverable over time.

Specialists in alcohol and other drug prevention

hello@360edge.com.au | 1300 988 184

www.360edge.com.au



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