

Elon Musk says ketamine can get you out of a 'negative frame of mind'—what does the research say?

March 21 2024, by Julaine Allan



One 10 ml vial of 1000 mg ketamine. Credit: Psychonaught/Wikipedia

X owner Elon Musk [recently described](#) using small amounts of ketamine "once every other week" to manage the "chemical tides" that cause his depression. He says it's helpful to get out of a "negative frame of mind."

This has caused a range of reactions in the media, including on X (formerly Twitter), from strong support for Musk's choice of [treatment](#), to allegations he has a drug problem.

But what exactly is ketamine? And what is its role in the treatment of depression?

It was first used as an anesthetic

Ketamine is a [dissociative anesthetic](#) used in surgery and to relieve pain.

At certain doses, people are awake but are disconnected from their bodies. This makes it useful for paramedics, for example, who can continue to talk to injured patients while the drug blocks pain but without affecting the person's breathing or blood flow.

Ketamine is also used to sedate animals in veterinary practice.

Ketamine is a mixture of two molecules, usually referred to as S-Ketamine and R-Ketamine.

S-Ketamine, or esketamine, is stronger than R-Ketamine and was approved in 2019 in the United States under the drug name Spravato for

serious and long-term [depression](#) that has not responded to at least two other types of treatments.

Ketamine is thought to [change chemicals in the brain](#) that affect mood. While the exact way ketamine works on the brain is not known, scientists think it changes the amount of the neurotransmitter glutamate and therefore changes symptoms of [depression](#).

How was it developed?

Ketamine was first synthesized by chemists at the Parke Davis pharmaceutical company in Michigan in the United States as an anesthetic. It was tested on a group of prisoners at Jackson Prison in Michigan in 1964 and found to be fast acting with [few side effects](#).

The US Food and Drug Administration [approved](#) ketamine as a general anesthetic in 1970. It is now on the World Health Organization's core list of essential medicines for health systems worldwide as an [anesthetic drug](#).

In 1994, following patient reports of improved depression symptoms after surgery where ketamine was used as the anesthetic, researchers began studying the effects of low doses of ketamine on [depression](#).

The first clinical trial results were [published in 2000](#). In the trial, seven people were given either intravenous ketamine or a salt solution over two days. Like the earlier case studies, ketamine was found to reduce symptoms of depression quickly, often within hours and the effects lasted up to seven days.

Over the past 20 years, researchers have studied the effects of ketamine on [treatment resistant depression, bipolar disorder](#), post-traumatic stress disorder [obsessive-compulsive disorder, eating disorders and for](#)

[reducing substance use](#), with generally positive results.

One study in a [community clinic](#) providing ketamine intravenous therapy for depression and anxiety found the majority of patients reported improved depression symptoms eight weeks after starting regular treatment.

While this might sound like a lot of research, it's not. A [recent review of ketamine research](#) conducted in the past 30 years found only 22 ketamine studies involving a total of 2,336 patients worldwide. In comparison, in 2021 alone, there were 1,489 studies being conducted on [cancer drugs](#).

Is ketamine prescribed in Australia?

Even though the research results on ketamine's effectiveness are encouraging, scientists still don't really know how it works. That's why it's not readily available from GPs in Australia as a standard depression treatment. Instead, ketamine is mostly used in specialized clinics and research centers.

However, the clinical use of ketamine is increasing. [Spravato nasal spray](#) was [approved](#) by the Australian Therapeutic Goods Administration (TGA) in 2021. It must be administered under the [direct supervision](#) of a health-care professional, usually a psychiatrist.

Spravato [dosage](#) and frequency varies for each person. People usually start with three to six doses over several weeks to see how it works, moving to fortnightly treatment as a maintenance dose. The [nasal spray costs between A\\$600 and \\$900](#) per dose, which will significantly limit many people's access to the drug.

Ketamine can be prescribed "off-label" by GPs in Australia who can

prescribe schedule 8 drugs. This means it is up to the GP to assess the person and their medication needs. But [experts in the drug](#) recommend caution because of the lack of research into negative side-effects and longer-term effects.

What about its illicit use?

Concern about use and misuse of ketamine is heightened by highly publicized deaths connected to the [drug](#).

Ketamine has been used as a recreational drug since the 1970s. People report it makes them feel euphoric, trance-like, floating and dreamy. However, the amounts used recreationally are typically higher than those used [to treat depression](#).

Information about deaths due to [ketamine](#) is limited. Those that are reported are [due to accidents or ketamine combined with other drugs](#). No deaths have been reported in [treatment settings](#).

Reducing stigma

Depression is the third leading cause of [disability worldwide](#) and effective treatments are needed.

Seeking medical advice about treatment for depression is wiser than taking Musk's advice on [which drugs to use](#).

However, Musk's public discussion of his mental health challenges and experiences of treatment has the potential to reduce stigma around [depression](#) and help-seeking for mental health conditions.

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