

Does methamphetamine use cause Parkinson's? And what do pizza boxes have to do with it?

October 24 2022, by Nicole Lee and Steven Bothwell



Crystal methamphetamine. Credit: public domain

The South Australian government is planning to roll out a new [mass media campaign](#) about the impact of using methamphetamine, including crystal methamphetamine or "ice" and powdered methamphetamine or "speed".

The campaign includes warning messages on pizza boxes—presumably because [young people](#) are the group most likely to try [methamphetamine](#) and they also eat lots of pizza.

It's based on [research](#) from a few years ago that [links](#) illicit use of methamphetamine and Parkinson's disease.

The researchers looked at [changes](#) in [parts of the brain](#) after methamphetamine use and say they look similar to those in Parkinson's patients.

But what does the research really tell us about the link? And will pizza box messages prevent these types of harm?

Adelaide researchers make world-first link between meth use and Parkinson's disease <https://t.co/HNXN3qjNPi>

— ABC Adelaide (@abcadelaide) [October 16, 2022](#)

Is there a link between methamphetamine use and Parkinson's?

Parkinson's disease is a [brain disease](#) that progressively gets worse and has no cure. The key feature is deterioration of neurons that manage the amount of dopamine in a part of the brain, called the [substantia nigra](#). Symptoms start to show when [about 50% of the neurons](#) have been damaged.

This part of the brain is responsible for controlling movement as well as the production of the neurotransmitter [dopamine](#).

Dopamine is the feel good neurochemical and part of the reward pathway in the brain. Every time we do something pleasant—like eating, sex, listening to music—our brain releases a little bit of dopamine to make us feel good and remind us to do it again. Dopamine is also needed for lots of other functions including [thinking](#) and [moving](#).

Methamphetamine triggers the release of much larger amounts of dopamine than most other activities, which is where its intense pleasurable effects come from. But over time, with regular methamphetamine use, the brain's receptors become less sensitive. [Tolerance](#) results. Then the effects of the drug are not as strong, or you need to use more to get the same effect.

We already know regular methamphetamine use causes changes in brain [structure](#) (what the brain looks like) and [function](#) (how the brain works). And that those changes are similar to those seen in Parkinson's patients.

But as far as we know, unlike Parkinson's Disease, the changes after using methamphetamine are temporary and in most cases the brain resets itself back to normal functioning once use stops or becomes less frequent.

Is the link a causal one?

A number of animal and [human studies](#) have shown [a link](#) between people who have a history of methamphetamine use and the later development of Parkinson's disease in older age.

Studies have shown that people in treatment for methamphetamine problems are up to [two](#) to [three](#) times more likely to develop Parkinson's

disease.

However, it's hard to work out whether one causes the other because the numbers of people with both methamphetamine use and Parkinson's disease are very small.

The estimate of methamphetamine use is around [1.3%](#) of Australians), and the number of people who develop Parkinson's disease ([around 0.1% worldwide](#)) is relatively small.

The large majority of people who use methamphetamine generally use only [a handful of times a year](#) and for a short period in their lifetimes. So even if there is an increased risk of developing Parkinson's disease, the population risk is quite small.

Studies like those from the [UniSA researchers](#), that take a snapshot in time and look at the correlation of two events, aren't able to tell us whether [one thing causes another](#), only that they are related in some way.

So we don't know whether methamphetamine *causes* Parkinson's disease.

To really work out whether methamphetamine use causes Parkinson's disease a [longitudinal study](#) is needed. A [longitudinal study](#) would track people from say childhood to older age and measure their [brain structure](#) and function over time to see whether there is higher rate of Parkinson's disease among people who have used methamphetamine compared to those who haven't.

Other potential explanations

It's possible that short term brain changes from using methamphetamine have some longer term impact that make someone more vulnerable to developing a range of disorders later in life, including Parkinson's

disease.

But there may also be other explanations for the link.

For example, people who use methamphetamine regularly are more likely to have [poor nutrition](#) (because the drug reduces feelings of hunger), more likely to have [experienced trauma](#), and are at higher risk of [physical injury](#). These factors might affect the brain in ways that make the development of Parkinson's disease more likely.

[Genetics](#) plays a major role in Parkinson's disease and also [has some role](#) in the development of drug problems. So there might be a common genetic link.

It's also worth noting that other drugs, [including alcohol](#) and a range of common prescription drugs like medicines for treating psychotic disorders, depression, high blood pressure and epilepsy, also [increase the risk](#) of Parkinson's disease.

And the pizza boxes?

We know mass media campaigns for issues that affect a relatively small number of people are [not very effective](#). Targeted campaigns for people at risk of developing problems [tend to work better](#).

Drug use is one of the issues for which public campaigns are largely ineffective. In fact, they can actually increase problems by creating stigma. This makes people less likely to seek help for their drug problems.

So the pizza box idea is unlikely to have much impact at all.

Money wasted on these types of campaigns would be much better spent

on evidence-based interventions. These include addressing the social problems that increase the risk of using methamphetamine such as poverty and childhood trauma, effective [drug education programs](#) at school, harm reduction programs and [treatment](#).

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