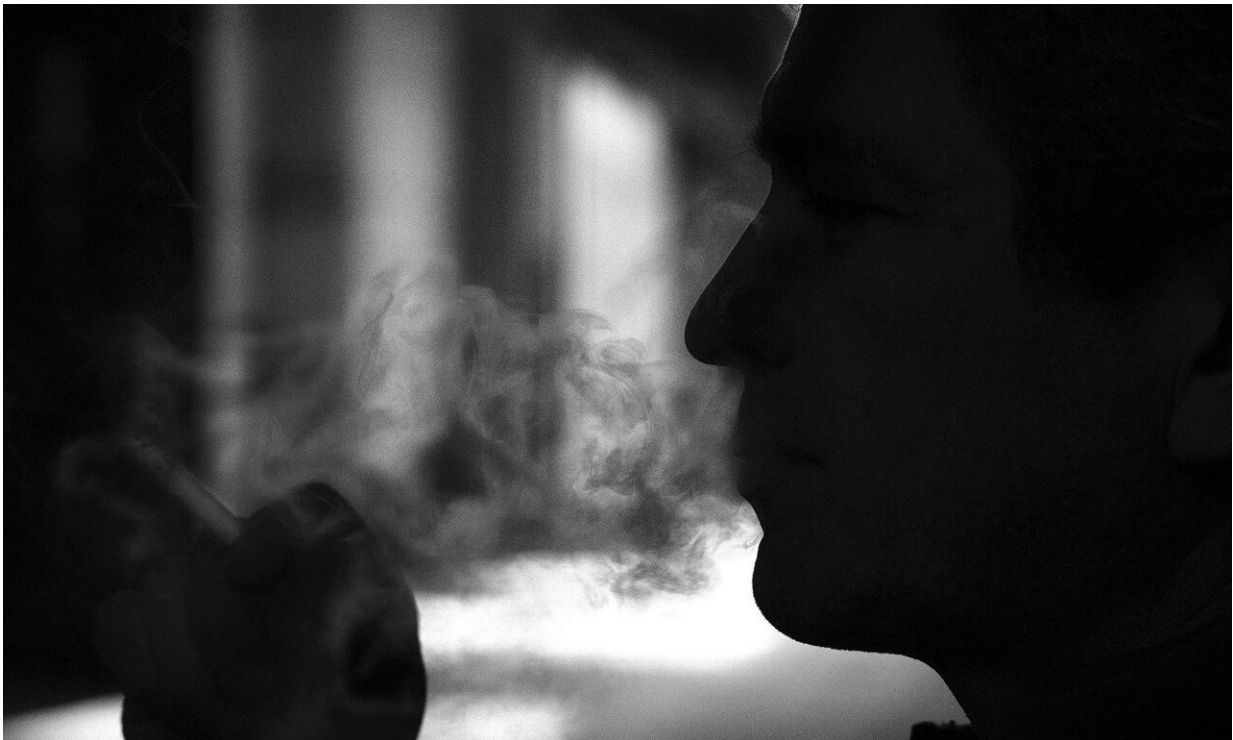


Trying to quit smoking? New research suggests higher levels of nicotine may help

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Allowing smokers to determine their nicotine intake while they are trying to quit is likely to help them kick the habit, according to an early study in 50 people led by Queen Mary University of London.

In the first study to tailor nicotine dosing based on smokers' choices

while trying to quit, the results suggest that most smokers who use stop-smoking medications can easily tolerate doses that are four times higher than those normally recommended.

Study author Dunja Przulj from Queen Mary University of London said: "Smokers determine their nicotine intake while they smoke, but when they try to quit, their nicotine levels are dictated by the recommended dosing of the treatment. These levels may be far too low for some people, increasing the likelihood that they go back to smoking.

"Medicinal nicotine products may be under-dosing smokers and could explain why we've seen limited success in treatments, such as patches and gum, helping smokers to quit. A change in their application is now needed.

"Our findings should provide reassurance to smokers that it is okay to use whatever nicotine doses they find helpful."

When nicotine replacement treatment was first evaluated in the 1970s, low doses were used because of concerns about toxicity and addictiveness. Evidence then emerged that nicotine on its own, outside of [tobacco products](#), has limited addictive potential, and that higher doses are safe and well tolerated. Despite this, stop-smoking medications have maintained lower nicotine levels in their products.

The new study, published in the journal *Addiction*, examined 50 smokers in a tobacco dependence clinic in Argentina, and is the first in the world to try a combined approach of 'pre-loading' nicotine prior to the quit date, and tailoring nicotine levels based on patient feedback.

Participants started on one daily 21mg nicotine patch four weeks prior to their quit date. The dose was increased weekly by another 21mg patch unless participants reported [adverse effects](#) or did not wish to increase

the dose, up to a maximum of four patches totalling 84mg/day. The dose was reduced by 21mg/day each week from one week after their quit date, until it reverted back to the standard dose (21mg/day) four weeks later.

Participants were advised to continue to smoke as they desired throughout the pre-quit period, and were offered additional oral nicotine replacement therapies.

The team found that:

- Of the 50 participants, 90 per cent progressed to at least three patches, while 72 per cent progressed to four patches.
- 82 per cent of participants achieved four weeks validated abstinence from smoking, and experienced no significant increase in withdrawal symptoms, including urges to smoke.
- Cigarette consumption, smoke intake and enjoyment of smoking declined significantly during the pre-quit period, and the intervention was rated as helpful and easy to adhere to.
- During the pre-quit period, the number of cigarettes smoked per day reduced significantly from 20/day at the start to 6/day by the quit date.
- The number of adverse effects increased as patch dose increased. The most common of these were nausea, followed by vomiting, but were mainly mild and well tolerated.
- Two participants rated their adverse effects as 'severe', both at the 63mg dose. One reported headaches, nausea and feeling faint; the other experienced nausea and blurry vision. Both reduced their dose back to 42mg/day.
- Only 6 per cent of participants dropped out of treatment and none dropped out because of patch side effects.

Professor Peter Hajek from Queen Mary University of London added:

"Smokers are perfectly capable of determining which doses of nicotine they find helpful. There is no risk of dangerous overdose, because nicotine includes an effective safety valve in the form of nausea.

"Our results also suggests that one of the reasons e-cigarettes are so much more popular and potentially more effective than other nicotine replacement treatments is that [smokers](#) can adjust their nicotine intake according to their needs."

It is thought that 'pre-loading' with nicotine leading up to the quit date might help weaken the conditioned link between smoking behaviour and reward, and reduce enjoyment of smoking. Also, if pre-loading nicotine levels are high enough, additional [nicotine](#) intake from cigarettes should cause nausea and become aversive.

The next step is to carry out a larger randomised trial to verify that the increased dosing, and especially its use prior to quitting, increases treatment efficacy.

The current study is limited in that it did not include a placebo control, so the abstinence data are only indicative. The reported reduction in enjoyment of smoking may also have been influenced by expectations. Additionally, with a sample size of 50, rare adverse reactions cannot be excluded.

More information: Dunja Przulj et al. Progressive nicotine patch dosing prior to quitting smoking: feasibility, safety and effects during the pre-quit and post-quit periods, *Addiction* (2018). [DOI: 10.1111/add.14483](https://doi.org/10.1111/add.14483)

Provided by Queen Mary, University of London

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