



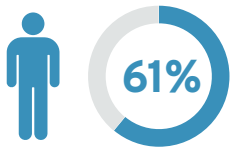
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The estimated risk of developing mild cognitive impairment

WOMEN

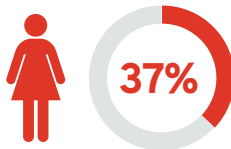


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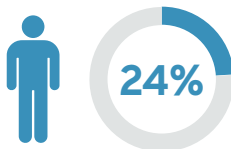


The risk of developing dementia is lower

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EXPLAINER

Can Nicotine Slow Age-Related Cognitive Decline?

May 2025

Introduction

Age-related neurocognitive disorders include dementias—of which Alzheimer’s disease is the most common—and mild cognitive impairment, which is less severe and can precede a dementia diagnosis. These conditions affect memory and other executive functions, thereby decreasing a person’s ability to care for themselves and participate in society. Alzheimer’s disease alone is the [sixth leading cause of death](#) in the United States and the only top cause of death without known prevention methods, treatments, or cures.

The [estimated risk](#) of developing mild cognitive impairment is 71 percent for women and 61 percent for men; however, the risk of developing dementia is lower at 37 percent for women and 24 percent for men. This represents a significant burden to individuals, families, and social services. A 2024 study estimated that by 2060, the cost of formal care for age-related neurocognitive disorders will reach [\\$1.4 trillion annually](#). When researchers included informal caregiving costs (e.g., lost wages), that estimate rose to between \$2.2 trillion and \$3.3 trillion. Another economic modeling study including the lost quality of life for people with dementia and their caregivers found that the cost of care will reach [\\$781 billion](#) in 2025.

Given the high burden of these illnesses and the lack of prevention methods and treatment options, continued exploration into every potentially advantageous avenue is vital. One chemical with surprising potential is nicotine; however, understanding its potential requires looking beyond its role in tobacco addiction and smoking to explore alternative uses and consumption methods.

Nicotine, smoking, and neurocognition

Nicotine’s role in perpetuating smoking is undeniable, but when isolated from the thousands of chemicals in cigarette smoke, [nicotine](#) presents few meaningful [health risks](#) to adults. Researchers have been exploring the [therapeutic effects of nicotine](#) since the 1920s and its effects on neurocognitive disorders specifically since the 1980s. Nevertheless, the association between nicotine and neurocognitive disorders is [difficult to ascertain](#) because of nicotine’s close connection to smoking. Although smoking tobacco is associated with [greater risk of neurocognitive disorders](#), nicotine alone is not—in fact, it may even be a viable treatment option.

Studies using smokers who have abstained from smoking overnight generally associate nicotine administration with [improved cognitive performance](#). However, this improvement could be due to the resolution of nicotine withdrawal symptoms rather than nicotine’s direct effect on measures of cognitive performance. Studies using non-smoking adults without neurocognitive disorders offer mixed results, suggesting that an [optimal amount of nicotine](#) may actually improve cognitive performance. [Additional evidence indicates](#) that adults with existing neurocognitive impairment stand to benefit the most from therapeutic nicotine administration.

Short-term administration of nicotine to older adults with mild cognitive impairment, Alzheimer’s disease, and age-related memory impairment have yielded [improved measures](#) of cognitive performance. Furthermore, these studies have concluded



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Expected in late 2025, the results of this study will help expand our understanding of nicotine's effects on cognitive performance among older people and verify the safety of long-term nicotine patch use.

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that nicotine delivered intravenously, under the skin, or via a patch placed on the skin results in [lower potential for abuse and fewer negative side effects](#) than orally administered products. However, greater inquiry is needed into the long-term safety and effectiveness of nicotine in managing neurocognitive disorder symptoms.

Fortunately, one such study is underway. The [Memory Improvement Through Nicotine Dosing \(MIND\) Study](#) is a two-year clinical trial to assess the effect of long-term nicotine skin patch use on mild cognitive impairment symptoms. The MIND Study [follows 380 adults](#) between the ages of 55 and 90 with existing mild cognitive impairment. Half of the participants were given nicotine patches of varying strengths at random, while the other half received placebo patches. Expected in late 2025, the results of this study will help expand our understanding of nicotine's effects on cognitive performance among older people and verify the safety of long-term nicotine patch use.

Alternative pathways for nicotine administration

Although smoking combustible cigarettes is the most common method of consuming nicotine, it is also the [most harmful](#). Isolating nicotine from the chemical products that result from burning or processing tobacco leaves decreases the health impacts of nicotine consumption. This is one reason why many studies of nicotine's effects on neurocognition, including the MIND Study, use skin patches to deliver nicotine to participants. However, the delivery method used may also impact nicotine's effect on neurocognitive disorder symptoms.

Along with the amount of nicotine in a product, the delivery method affects how quickly and intensely the effects of nicotine are felt as well as how quickly those effects subside. Inhaling nicotine is the [fastest way](#) for it to reach the brain and for a person to feel its effects, while skin patches and oral products result in comparatively [slower nicotine delivery](#)—the benefits of which are steadier and longer-lived (albeit less intense) effects. Depending on the desired outcome, different delivery mechanisms may be more effective.

As research on nicotine's effects on neurocognitive disorder symptoms and progression continues, it may be worthwhile to explore different delivery methods. Although nicotine skin patches are a natural fit for delivering slower, sustained amounts of nicotine, there may be a yet-to-be-determined role for faster delivery mechanisms. For example, [combination nicotine replacement therapy](#) uses both nicotine patches and oral or inhaled products (e.g., gums, lozenges, sprays, inhalers) to help a person quit smoking. The patch maintains nicotine levels while the other products offer relief from breakthrough cravings. There may be similar applications for faster-acting oral products in addition to patches as therapeutics for neurocognitive disorders.

Conclusion

As a larger proportion of Americans reach the stage of life in which neurocognitive disorders most commonly occur, exploring all potential treatment options becomes even more important. Despite nicotine's role in smoking addiction, its potential for improving neurocognitive disorder symptoms may redeem its reputation.