

Treating sleep apnea can improve memory in people with cognitive decline

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Credit: AI-generated image ([disclaimer](#))

There is increasing recognition of the important role sleep plays in our brain health. Growing evidence suggests disturbed sleep may increase the risk of developing dementia.

I and University of Sydney colleagues have published a [new study](#)

showing treating [sleep apnea](#) in [older adults](#) with mild cognitive impairment can improve memory, but not other areas of cognition, in the short term.

As there is no current treatment or cure for [dementia](#), increasing efforts have focused on developing novel approaches to slow its progression. Mild cognitive impairment is the stage between the expected cognitive decline of normal aging and the more serious decline of dementia.

In mild cognitive impairment, the individual, family and friends notice cognitive changes, but the individual can still successfully carry out everyday activities. Mild cognitive impairment is associated with an increased risk of developing dementia in subsequent years.

Researchers believe this is the optimal time to intervene to help prevent a future dementia diagnosis. Finding new ways to slow cognitive decline in those with mild cognitive impairment is therefore important.

How is sleep important for our brain health?

Sleep optimizes the ability of our brains to stabilize and consolidate newly learned information and memories. These processes can occur across all the different stages of sleep, with [deep sleep](#) (also known as stage 3 or restorative sleep) playing a key role.

We also now know the glymphatic system, or the waste management system of the brain, is [highly active during sleep](#), especially during deep sleep. This process allows [waste products](#), including toxins, our brain has built up during the day to be cleaned out.

Toxins in the brain include beta-amyloid, one of the key proteins in the development of Alzheimer's disease. Disturbing sleep could disrupt this cleaning process and lead to more accumulation of [beta-amyloid in the](#)

[brain](#).

The important role of sleep in these vital processes has led to the investigation of whether sleep disruption, including [sleep disorders](#), could be associated with changes in our cognition when we age, and a possible link to the development of dementia.

What is sleep apnea?

Sleep apnea is estimated to affect [1 billion people](#) worldwide. In Australia, [5–10% of adults](#) are diagnosed with the condition. Sleep apnea causes the throat (also called the [upper airway](#)) to close either completely (an apnea) or partially (a hypopnea) during sleep.

These closures or obstructions can range from ten seconds up to one minute and can lead to a drop in blood oxygen levels. To start breathing again, a short awakening occurs without the individual being aware.

In a person living with severe sleep apnea this process can happen 30 times or more an hour, causing very fragmented sleep. People with sleep apnea may snore, toss and turn, and others may notice them stopping breathing, choking or gasping for air during sleep. These repeated disruptions to sleep can cause sleepiness and reduce alertness during the day which, for some people, leads to difficulties performing tasks.

Does sleep apnea increase our risk of dementia?

The sleep fragmentation, as well as the drops in blood oxygen at night time, are a double blow in dementia risk. Studies have shown sleep apnea to be associated with a [26% increase](#) in the development of cognitive impairment, as well as [greater amounts of beta-amyloid](#) in the [brain](#). However, it is not clear if treating sleep apnea could reduce this

risk.

The gold-standard treatment for sleep apnea is continuous positive airway pressure therapy, commonly known as CPAP, in which a mask connected to a pump blows continuous air down the upper airway, keeping it open. When the machine is being used it stops the airway from closing. It is not known whether treating sleep apnea will reduce the risk of dementia. Our new research, however, shows CPAP could be beneficial for memory in the short term.

Our study aimed to understand whether treating older adults with both sleep apnea and mild cognitive impairment could improve thinking and memory skills in the short term.

The trial assessed the effect of CPAP treatment on memory and thinking skills compared to no treatment. This was a crossover study, which means all participants had both CPAP and no treatment during the trial, but at different times. Some had CPAP first, then swapped. The others had no treatment first, then swapped. Trained staff helped participants get established with the therapy, and after using it for three months, participants underwent a series of cognitive tests.

The researchers found that compared to not treating sleep apnea, thinking skills were not improved with CPAP, whereas some improvements in memory were observed. This suggests treating [sleep apnea](#) could potentially improve outcomes in the short term, but it is unknown whether it would have any impact on long-term cognitive decline.

A previous study suggested CPAP could slow cognitive changes over one year in older adults with [mild cognitive impairment](#) and [sleep apnea](#). However, studies of longer duration are needed before we can say what the long-term effects look like.

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