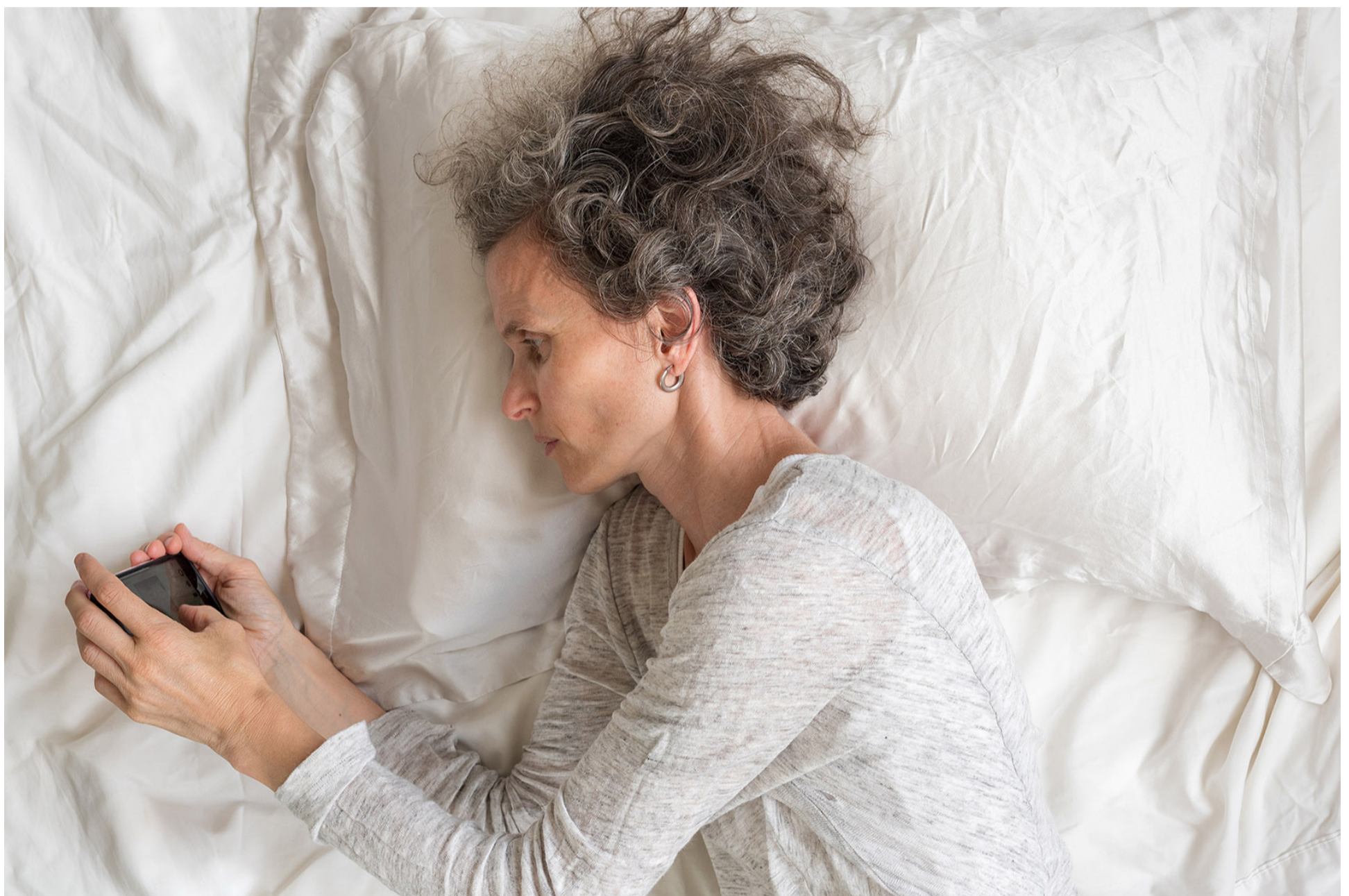


Avoid Risks

## SLEEP AND ALZHEIMER'S DISEASE: MORE EVIDENCE ON THEIR RELATIONSHIP

February 6, 2019 | [Nick McKeehan](#)



All of us know that a night of bad sleep can impair our ability to think the following day. However, research also suggests that chronically getting too few hours of sleep (<6 hours per night) may also increase your risk of Alzheimer's disease and dementia [1] [2]. Alzheimer's disease is characterized by the presence of amyloid plaques and tau tangles in the brain. Previous studies suggested that poor sleep quality was associated with the presence of amyloid plaques in cognitively healthy individuals [3], and that even one night of sleep deprivation can increase the levels of amyloid in the cerebral spinal fluid (CSF), the fluid that bathes the brain [4][5]. Two recent studies in *Science Translational Medicine* and *Science* also suggest that poor sleep may also be associated with increased brain levels of tau.

Sleep is divided into different stages and alternates between non-rapid eye movement (NREM) sleep and rapid eye movement (REM) sleep. A full night of sleep is important because the stages are not divided equally throughout the night. NREM sleep is predominant in the first part of the night while REM increases later in the night. NREM sleep is important for forming long-term memories while REM sleep is when most of our dreams occur.

In one study, researchers monitored sleep in 119 participants, most of them cognitively healthy, for six nights with an EEG (a device that measures brain activity) worn on the forehead and a sleep actigraph (a device that measures sleep/wake activity) on the wrist. Some of the participants underwent tau imaging in their brain while others had tau measured in the CSF. Participants with the highest levels of tau had the lowest levels of NREM sleep—the part of sleep important for forming long-term memories. Interestingly, participants with highest tau levels had the greatest amount of total sleep time, but they also napped more, suggesting that their quality of sleep was poor [6].

While the previous study showed that poor sleep is associated with tau pathology, it did not indicate whether poor sleep can increase tau. In another small study, individuals (age 30-60) who were cognitively healthy had one night of good sleep and one night of sleep deprivation. Sleep deprivation increased CSF levels of tau by over 50%. This increase was correlated with an increase in amyloid after sleep deprivation [7].

These studies provide a clearer picture of the relationship between sleep and Alzheimer's disease. Not all individuals with amyloid plaques will go on to develop dementia. In fact, studies show that tau accumulation is a better predictor of cognitive decline than amyloid [8]. However, many questions remain. It is still unknown whether poor sleep directly causes Alzheimer's. Amyloid plaques begin to emerge about 10-15 years before any cognitive symptoms are present, and there is likely a bidirectional relationship between sleep duration and Alzheimer's disease and dementia [9]. Poor sleep may increase your risk of Alzheimer's disease, and patients with Alzheimer's disease have difficulty sleeping and a disrupted circadian rhythm. Also, it is not known whether an increase in tau in the CSF after sleep deprivation is an indication of tau accumulation in the brain. Finally, too little sleep can also lead to other diseases such as cardiovascular disease, diabetes, and depression—themselves risk factors for Alzheimer's.

There are many things you can do to improve your sleep—the most important of which is to allow yourself enough time for 7-8 hours of sleep. Maintaining a regular bedtime routine and sleep schedule, and abstaining from caffeine and alcohol near bedtime, are also important. Many individuals turn to [sleep medications](#), but these may present their own risks. Those with more severe sleep problems should talk to a healthcare provider for additional treatment options. Beyond feeling refreshed in the morning, there are many reasons to aim for 7-8 hours of sleep for brain health.

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