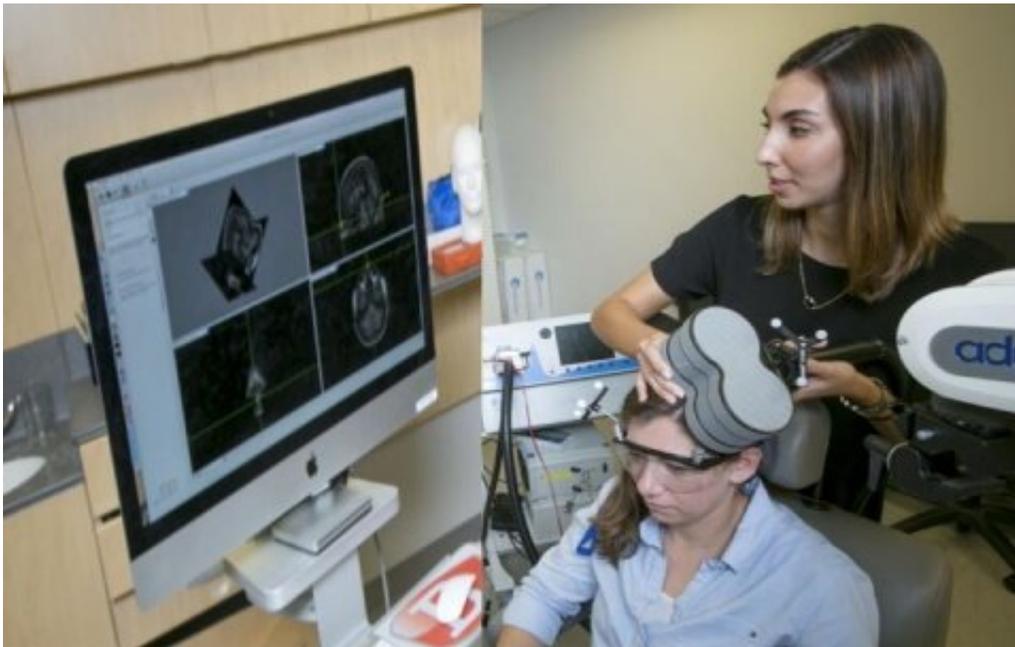


rTMS improves memory in younger and older adults

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Credit: Duke University

Magnetic stimulation of the brain improves working memory, offering a new potential avenue of therapy for individuals living with Alzheimer's disease and other forms of dementia, according to new research from the Duke University School of Medicine.

Healthy younger and older adult participants who received a therapy called [repetitive transcranial magnetic stimulation](#) (rTMS) performed

better on a [memory task](#) than during an rTMS-like placebo in the study, which was published here in *PLoS One*.

"This study relies on highly individualized parameters, from the selection of the stimulated target, based on fMRI activation, to the selection of the difficulty, titrated according to subjects' performance. Now that we have shown that these specific parameters can improve performance in healthy subjects, we will be able to extend it to populations with memory deficits," said Lysianne Beynel, Ph.D., a postdoctoral associate in the Department of Psychiatry and Behavioral Sciences.

Working memory is the process of recalling and then using relevant information while performing a task. It's a key component of day-to-day tasks like driving to a new location, making a recipe, or following instructions. Individuals with Alzheimer's disease, which will more than double by 2050, and other forms of dementia, experience progressive loss of working memory and other forms of cognition, leading to a greater risk of injury or death and reducing their ability to function without [home care](#).

Twenty-nine [young adults](#) and 18 older adults completed the study, which involved trying to remember and then reproduce a series of letters in alphabetical order. The authors applied either online [high-frequency](#) (5Hz) rTMS, or a placebo-like sham over the left [prefrontal cortex](#), an area on the brain responsible for higher executive function. Participants of all ages who received rTMS performed better than those who received the rTMS-like placebo.

"Interestingly, we only saw this effect during when participants were trying their hardest, suggesting a real use-it-or-lose it principle at work here," said co-author Simon W. Davis, Ph.D. "Contrary to much of what we hear, aging brains have a remarkable capability to remember past

events and to use that information in a flexible manner. The brain stimulation applied in our study shows that [older adults](#) benefited just as much as the young."

More information: L. Beynel et al, Online repetitive transcranial magnetic stimulation during working memory in younger and older adults: A randomized within-subject comparison, *PLOS ONE* (2019). [DOI: 10.1371/journal.pone.0213707](https://doi.org/10.1371/journal.pone.0213707)

Provided by Duke University

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