

Does 'brain training' work?

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Credit: Rice University

Computer based 'brain training' can boost memory and thinking skills in

older adults, but many programs promoted by the \$1 billion brain training industry are ineffective, reveals new research by the University of Sydney.

Published today in *PLOS Medicine*, the study shows that engaging older adults computer-based cognitive training (also known as "[brain training](#)") can lead to improvements in memory, speed, and visuospatial skills.

However, it has no impact on attention or executive functions such as impulse control, planning and problem solving.

Brain degeneration and cognitive impairment are among the most feared outcomes of growing old. With dementia predicting to engulf more than 100 million people across the globe by 2050, reducing incidence of dementia is of ever-increasing importance.

Dementia refers to a progressive decline in a person's mental functioning to the point they can no longer carry out day to day tasks.

Promising new evidence now indicates that engaging in challenging mental activities can help maintain cognition and lower the risk of dementia.

In response, a lucrative brain training industry has quickly developed, tapping into the anxieties of baby boomers now entering retirement age and eager to start activities that protect their brains.

This new research by the Regenerative Neuroscience Group at the Brain and Mind Research Institute (BMRI) reveals that engaging in group-based brain training under the supervision of a trainer is effective at improving performance on a range of cognitive skills in healthy older adults.

By contrast, self-directed brain training at home had no therapeutic effect on cognition.

"Our results send a key message to the public," says group leader Associate Professor Michael Valenzuela.

"They show that brain training carried out in a centre can improve cognition in [older adults](#), but commercial products promoted for solo training use at home just don't work. There are better ways to spend your time and money".

The research team combined outcomes from 51 randomised clinical trials, including almost 5,000 participants, using a mathematical approach called meta-analysis.

"This is a very large number of [clinical trials](#) and the results were conclusive," says A/Prof Valenzuela.

"We now understand how to prescribe brain training based on the highest standards of medical evidence."

Part of this prescription is the frequency of training, also identified as an important factor.

Lead author of the study Dr Amit Lampit of the BMRI said that:

"Training one to three times a week was effective, but training more than this neutralised any cognitive benefits.

"The brain's plastic mechanisms may saturate if training is too frequent. Like strenuous physical exercise, we recommend at least one rest day between training sessions."

Valenzuela emphasises that it is important to put the results in

perspective: "Modest gains are to be expected. This is not a magic bullet and we still don't know if this type of activity can prevent or delay dementia. Much more research is needed," he said.

Fast facts:

- Brain training (computerized cognitive training, CCT) is a procedure for enhancing memory and [thinking skills](#) by practicing mentally challenging exercises on computer.
- The most common cause for dementia is Alzheimer's disease. It can affect memory, thinking, orientation, comprehension, calculation, learning capacity, language and judgment.
- Dementia will soon engulf more than 100 million people across the globe
- More than 330,000 Australians are living with dementia
- More than 1,700 new cases of dementia are diagnosed in Australia weekly
- Without effective prevention or a cure, more than a million Australians will be living with dementia by 2050
- Dementia risk factors include hypertension, diabetes, cardiovascular disease, smoking, depression, physical inactivity and obesity
- Dementia will become the third greatest source of health and residential aged care spending within two decades.

More information: Lampit A, Hallock H, Valenzuela M (2014) Computerized Cognitive Training in Cognitively Healthy Older Adults: A Systematic Review and Meta-Analysis of Effect Modifiers. *PLoS Med* 11(11): e1001756. [DOI: 10.1371/journal.pmed.1001756](https://doi.org/10.1371/journal.pmed.1001756)

Provided by University of Sydney

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