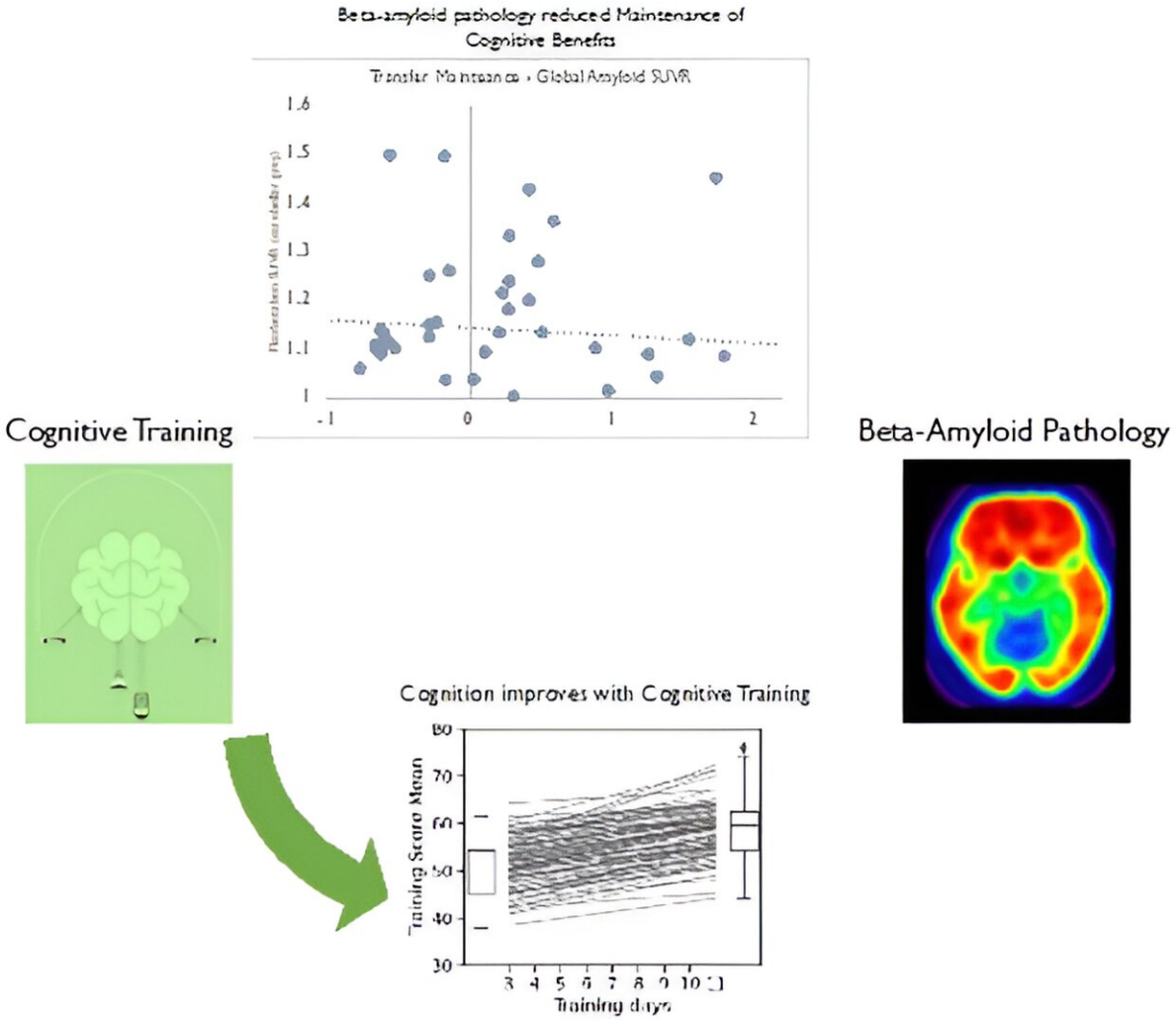
Study finds cognitive training less effective in healthy older adults with beta-amyloid deposits

June 10 2024



Whereas intense cognitive training improves cognition in healthy older adults the maintenance of cognitive training effects depends on how much amyloid healthy older adults individuals carry. Credit: Gerard Bischof, Tim Fellerhoff, Kathrin Giehl, Alexander Drzezga, Department of Nuclear Medicine, University Hospital Cologne, Cologne, Germany.

The presence of beta-amyloid deposits in the brain significantly limits the effectiveness of cognitive training in healthy older adults, according to new research presented at the 2024 Society of Nuclear Medicine and

Molecular Imaging Annual Meeting. Assessed by PET imaging, adults with amyloid deposits were less likely to retain skills and information learned during cognitive training. This intricate relationship emphasizes the necessity of comprehensive strategies to address cognitive decline in aging individuals.

Cognitive plasticity is the ability of the brain to grow, adapt, and reorganize as it learns new skills. Cognitive training can help people improve their cognitive plasticity, even into the later decades of their lives.

"While certain factors such as education, age, and genetic predisposition can have an impact on how easily a person can learn new skills, the impact of molecular age-related changes in the form of fibrillar amyloid pathology on plasticity remains to be investigated," said Gerard Bischof, deputy group leader for Multimodal Neuroimaging in the Department of Nuclear Medicine at University Hospital Cologne in Cologne, Germany. "Expanding our knowledge of why cognitive training does not benefit everyone may allow us to improve non-pharmaceutical interventions."

In the multicenter cognitive intervention study, 76 healthy older adults completed 12 60-minute cognitive training sessions consisting of validated computerized tasks designed to train executive function, memory, attention, and processing speed. A neuropsychological test battery was administered at baseline, post-training, and at three months to assess training improvement across the sessions, immediate improvement, and maintenance. In addition, ^{18}F-florbetaben PET was performed to image fibrillary beta-amyloid plaques. Standard uptake value ratios (SUVR) were calculated and evaluated.

The presence of beta-amyloid on PET scans unveiled a noteworthy

impediment to the potential benefits of cognitive training. Controlling for baseline effects, age, education, and intelligence, individuals with higher SUVRs (more beta-amyloid deposition) showed significantly less training improvement across sessions and transfer maintenance at three month follow-up. Interestingly, immediate transfer improvement was not related to amyloid deposition.

"These findings underscore the interplay between cognitive resilience and amyloid pathology in the aging brain. While cognitive training exhibited the capacity to stimulate cognitive plasticity among healthy older adults, the efficacy of these interventions faced significant constraints in the presence of amyloid pathology," stated Bischof.

"This could potentially lead to a rethinking of interventions for healthy older populations that include markers of Alzheimer's pathology. In addition, different training strategies may be needed for individuals with different levels of Alzheimer's pathology."

More information: Abstract 241419: Bischof et al. Imaging biomarker of beta-amyloid pathology limits cognitive plasticity in healthy aging: A multi-center intervention study, *Journal of Nuclear Medicine* (2024).

Provided by Society of Nuclear Medicine and Molecular Imaging

Citation: Study finds cognitive training less effective in healthy older adults with beta-amyloid deposits (2024, June 10) retrieved 23 June 2024 from https://medicalxpress.com/news/2024-06-cognitive-effective-healthy-older-adults.html