

## **Brain scans demonstrate link between education and Alzheimer's**

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A test that reveals brain changes believed to be at the heart of Alzheimer's disease has bolstered the theory that education can delay the onset of the dementia and cognitive decline that are characteristic of the disorder.

Scientists at the Alzheimer's Disease Research Center at Washington University School of Medicine in St. Louis found that some study participants who appeared to have the brain plaques long associated with Alzheimer's disease still received high scores on tests of their cognitive ability. Participants who did well on the tests were likely to have spent more years in school.

"The good news is that greater education may allow people to harbor amyloid plaques and other brain pathology linked to Alzheimer's disease without experiencing decline of their cognitive abilities," says first author Catherine Roe, Ph.D., research instructor in neurology.

The findings are published in the November Archives of Neurology.

Roe and her colleagues at the Alzheimer's Disease Research Center used the study participants' education levels to approximate a theoretical quality called cognitive reserve: improved abilities in thinking, learning and memory that result from regularly challenging and making use of the brain. Neurologists have long speculated that this quality, roughly equivalent to the benefits that accrue in the body via regular physical exercise, can help the brain cope with the damage caused by Alzheimer's



disease.

Doctors still cannot conclusively diagnose Alzheimer's disease in any manner other than post-mortem brain examination. But Washington University scientists have shown that an imaging agent for positron emission tomography scans, Pittsburgh Compound B (PIB), can reveal the presence of amyloid plaques, a key brain change that many neurologists suspect either causes Alzheimer's or is closely linked to its onset.

"This technique has been used before to analyze patients with dementia and their education levels, but our study is among the first, if not the first, to include both patients with Alzheimer's-type dementia and nondemented participants," says Roe.

In addition to scanning the participants' brains with PIB, the participants took several tests that assessed their cognitive abilities and status. They also ranked their educational experience: high-school degree or less, college experience up to an undergraduate degree, and graduate schooling.

As expected, those whose brains showed little evidence of plaque buildup scored high on all the tests. But while most participants with high levels of brain plaque scored poorly on the tests, those who had done postgraduate work still scored well. Despite signs that Alzheimer's might already be ravaging the brains of this subgroup, their cognitive abilities had not declined and they had not become demented.

Roe and her colleagues plan follow-up studies that will look at other potential indicators of increased cognitive reserve, including hobbies, social and intellectual activities and the mental challenges provided by professional duties.



## Source: Washington University School of Medicine

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