

# High blood pressure, diabetes, smoking and obesity in middle age may shrink brain, damage thinking

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A new study suggests smoking, high blood pressure, diabetes and being overweight in middle age may cause brain shrinkage and lead to cognitive problems up to a decade later. The study is published in the August 2, 2011, print issue of *Neurology*<sup>®</sup>, the medical journal of the American Academy of Neurology.

"These factors appeared to cause the brain to lose volume, to develop lesions secondary to presumed vascular injury, and also appeared to affect its ability to plan and make decisions as quickly as 10 years later. A different pattern of association was observed for each of the factors," said study author Charles DeCarli, MD, with the University of California at Davis in Sacramento and a Fellow of the American Academy of Neurology. "Our findings provide evidence that identifying these risk factors early in people of middle age could be useful in screening people for at-risk dementia and encouraging people to make changes to their lifestyle before it's too late."

The study involved 1,352 people without dementia from the Framingham Offspring Study with an average age of 54.

Participants had body mass and waist circumference measures taken and were given blood pressure, cholesterol and diabetes tests. They also underwent brain MRI scans over the span of a decade, the first starting about seven years after the initial risk factor exam. Participants with

stroke and dementia at baseline were excluded, and between the first and last MRI exams, 19 people had a stroke and two developed dementia.

The study found that people with [high blood pressure](#) developed white matter hyperintensities, or small areas of vascular brain damage, at a faster rate than those with normal [blood pressure](#) readings and had a more rapid worsening of scores on tests of executive function, or planning and decision making, corresponding to five and eight years of chronological aging respectively.

People with diabetes in middle age lost brain volume in the hippocampus (measured indirectly using a surrogate marker) at a faster rate than those without [diabetes](#). Smokers lost brain volume overall and in the hippocampus at a faster rate than nonsmokers and were also more likely to have a rapid increase in white matter hyperintensities.

People who were obese at [middle age](#) were more likely to be in the top 25 percent of those with the faster rate of decline in scores on tests of executive function, DeCarli said. People with a high waist-to-hip ratio were more likely to be in the top 25 percent of those with faster decrease in their [brain](#) volume.

Provided by American Academy of Neurology

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