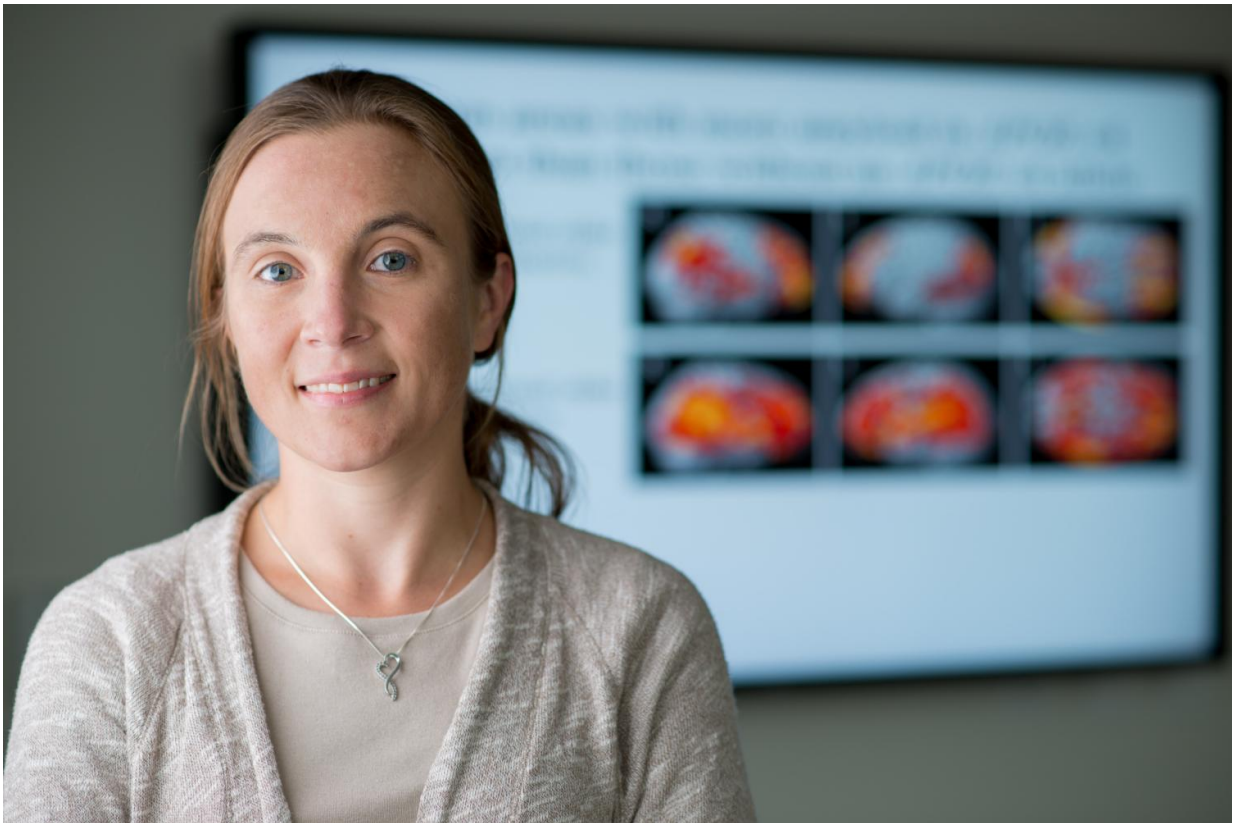


# Brain scans link physical changes to cognitive risks of widely used class of drugs

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Older adults might want to avoid a using class of drugs commonly used in over-the-counter products such as nighttime cold medicines due to their links to cognitive impairment, a research team led by Shannon Risacher, Ph.D., and other scientists at Indiana University School of Medicine has recommended. Using brain imaging techniques, the researchers found lower metabolism and reduced brain sizes among study participants taking the drugs known to have an anticholinergic effect, meaning they block acetylcholine, a nervous system neurotransmitter. Credit: Indiana University School of Medicine

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Using brain imaging techniques, the researchers found lower metabolism and reduced brain sizes among study participants taking the drugs known to have an anticholinergic effect, meaning they block acetylcholine, a nervous system neurotransmitter.

Previous research found a link between between the anticholinergic drugs and [cognitive impairment](#) and increased risk of dementia. The new paper published in the journal *JAMA Neurology*, is believed to be the first to study the potential underlying biology of those clinical links using neuroimaging measurements of [brain metabolism](#) and atrophy.

"These findings provide us with a much better understanding of how this class of drugs may act upon the brain in ways that might raise the risk of cognitive impairment and dementia," said Shannon Risacher, Ph.D., assistant professor of radiology and imaging sciences, first author of the paper, "Association Between Anticholinergic Medication Use and Cognition, Brain Metabolism, and Brain Atrophy in Cognitively Normal Older Adults."

"Given all the research evidence, physicians might want to consider alternatives to anticholinergic medications if available when working with their older patients," Dr. Risacher said.

Drugs with [anticholinergic effects](#) are sold over the counter and by prescription as sleep aids and for many chronic diseases including hypertension, cardiovascular disease, and chronic obstructive pulmonary

disease.

A list of anticholinergic drugs and their potential impact is at [http://www.agingbraincare.org/uploads/products/ACB\\_scale\\_-\\_legal\\_size.pdf](http://www.agingbraincare.org/uploads/products/ACB_scale_-_legal_size.pdf).

Scientists have linked anticholinergic drugs [cognitive problems](#) among older adults for at least 10 years. A 2013 study by scientists at the IU Center for Aging Research and the Regenstrief Institute found that drugs with a strong anticholinergic effect cause cognitive problems when taken continuously for as few as 60 days. Drugs with a weaker effect could cause impairment within 90 days.

The current research project involved 451 participants, 60 of whom were taking at least one medication with medium or high anticholinergic activity. The participants were drawn from a national Alzheimer's research project—the Alzheimer's Disease Neuroimaging Initiative—and the Indiana Memory and Aging Study.

To identify possible physical and physiological changes that could be associated with the reported effects, researchers assessed the results of memory and other cognitive tests, positron emission tests (PET) measuring brain metabolism, and magnetic resonance imaging (MRI) scans for brain structure.

The cognitive tests revealed that patients taking anticholinergic drugs performed worse than [older adults](#) not taking the drugs on short-term memory and some tests of executive function, which cover a range of activities such as verbal reasoning, planning, and problem solving.

Anticholinergic drug users also showed lower levels of glucose metabolism—a biomarker for brain activity—in both the overall brain and in the hippocampus, a region of the brain associated with memory

and which has been identified as affected early by Alzheimer's disease.

The researchers also found significant links between brain structure revealed by the MRI scans and anticholinergic [drug](#) use, with the participants using anticholinergic drugs having reduced brain volume and larger ventricles, the cavities inside the [brain](#).

"These findings might give us clues to the biological basis for the cognitive problems associated with anticholinergic drugs, but additional studies are needed if we are to truly understand the mechanisms involved," Dr. Risacher said.

Provided by Indiana University

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