

## News Release

July 12, 2012

**EMBARGOED: Hold for release until  
Saturday, July 14, 12:30 p.m. PDT**  
*Alzheimer's Association International Conference*

Journalists: For multimedia resources, including a graphic of the Road Map, and interview with the study author, visit the [Mayo Clinic News Network](#).

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### **Mayo Clinic Maps Brain, Finds Alzheimer's Patients Drive Differently**

*Results suggest varying brain activity may reduce the risk of the disease*

ROCHESTER, Minn. — Activity lingers longer in certain areas of the brain in those with Alzheimer's than it does in healthy people, Mayo Clinic researchers who created a map of the brain found. The results suggest varying brain activity may reduce the risk of Alzheimer's disease. The study, "*Non-stationarity in the "Resting Brain's" Modular Architecture,*" was presented at the Alzheimer's Association International Conference and recently published in the journal *PLoS One*. Researchers compared brain activity to a complex network, with multiple objects sharing information along pathways.

"Our understanding of those objects and pathways is limited," says lead author David T. Jones, M.D. "There are regions in the brain that correspond to those objects, and we are not really clear exactly what those are. We need a good mapping or atlas of those regions that make up the network in the brain, which is part of what we were doing in this study."

Researchers examined 892 cognitively normal people taking part in the Mayo Clinic Study of Aging, and set out to create an active map of their brains while the people were "at rest," not engaged in a specific task. To do this, they employed task-free, functional magnetic resonance imaging to construct an atlas of 68 functional regions of the brain, which correspond to the cities on the road map. Researchers filled in the roads between these regions by creating dynamic graphic representations of brain connectivity within a sliding time window.

This analysis revealed that there were many roads that could be used to exchange information in the brain, and the brain uses different roads at different times. The question to answer then, said Dr. Jones, is whether or not Alzheimer's patients used this map and these roads in a different way than their healthy peers.

“What we found in this study was that Alzheimer’s patients tended to spend more time using some roads and less time using other roads, biasing one over the other,” he says.

While more research is needed, the researchers say one implication is that how we use our brains may protect us from Alzheimer’s. Dr. Jones says exercise, education, and social contacts may help balance activity in the brain.

“Diversifying the mental space that you explore may actually decrease your risk for Alzheimer’s,” he says.

This work was supported by the National Institute on Aging, the Alexander Family Alzheimer’s Disease Research Professorship of the Mayo Foundation, and Alzheimer’s Association New Investigator grant.

Co-authors include David T. Jones, M.D.; Prashanthi Vemuri, Ph.D.; Matthew C. Murphy, Ph.D.; Jeffrey L. Gunter, Ph.D.; Matthew L. Senjem; Mary M. Machulda, Ph.D.; Scott A. Przybelski; Brian E. Gregg; Kejal Kantarci, M.D.; David S. Knopman, M.D.; Bradley F. Boeve, M.D.; Ronald C. Petersen, M.D., Ph.D.; and Clifford R. Jack, Jr., M.D.

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