

UW-Madison School of Medicine and Public Health: Silent strokes impair seniors' cognitive abilities

Posted on Monday, Apr 3, 2017

>> **WisPolitics is now on the State Affairs network. Get custom keyword notifications, bill tracking and all WisPolitics content. [Get the app or access via desktop.](#)**

Contact:

Susan Lampert Smith

(608) 890-5643

ssmith5@uwhealth.org

MADISON, Wis. — The sound of a chirp, like that in a video game, can help identify people at risk of cognitive decline.

A new University of Wisconsin-Madison study in the [Journal of Neurosurgery](#) is the first to be able to predict which patients are at risk of such decline caused by small, silent strokes.

People with unstable plaque in their carotid arteries scored poorly on cognitive tests and their brains showed evidence of suffering many so-called silent strokes.

Plaque is the substance that can build up and gradually block key blood vessels in some patients. The result is known as atherosclerosis. It is suspected that before completely blocking the vessel bits of plaque in the carotid arteries could break off and cause small injuries to the brain.

“We showed that these silent strokes are a lot more common than we thought and that we are able to predict which people will show cognitive decline by showing which ones are cracking or breaking apart with normal heartbeats,” says [Dr. Robert Dempsey](#), chair of neurosurgery at the [University of Wisconsin School of Medicine and Public Health](#) and lead author on the study. Dempsey estimates that 11 million

Americans a year could be affected by these silent strokes, which can lead to a decline in thinking, personality and memory long before an official diagnosis of dementia.

While people with more fully blocked arteries often have surgery to clear the plaque from the arteries, it was not known if people with only partial blockage and no symptoms of stroke were being affected, as well.

To do the study, Dempsey and co-author Dr. Stephanie Wilbrand studied 27 patients who had plaque blockages of their carotid arteries of more than 60 percent. (The carotid artery is found in the neck and is the major path of blood flow to the brain.) The patients had an average age of 71 and most were already taking aspirin and statin drugs to combat high cholesterol, which can lead to plaque building up and artery disease.

The researchers used ultrasound images to look at the carotid arteries as they pulsed with heartbeat. In some of the patients, the ultrasounds showed that the plaque was not only impeding blood flow but also cracking under the strain.

The study also measured cognitive decline with tests of intelligence, decision-making and motor skills. It found that the patients with the cracked plaque had the poorest scores on cognition tests. MRI images showed this group of patients also showed white matter hyperintensities (WMHs) in the brain, evidence of brain injury. Dempsey says these are thought to be the result of repeated injuries caused when small pieces of plaque break off the arteries, travel up and lodge in the brain, cutting off blood flow and killing a small part of the brain.

The researchers were actually able to “hear” this process taking place, by putting transcranial Doppler monitors on the patients’ skulls. They audibly tracked the plaque chips breaking off and hitting the brain, making a noise like a chirp in a video game. (Insert video #2 here.)

Dempsey says the researchers were surprised by how frequently this occurred in the group with the crumbly plaque – one subject had multiple incidents in the hour of monitoring.

“This suggests that silent strokes are a lot more common than had been known, and are an important cause of cognitive decline,” Dempsey says. “Now that we can identify who is at risk, we can intervene to prevent further decline.”

The research is part of a large, five-year effort, funded by a \$1.57 million grant from the National Institute of Neurological Disease and Stroke. Ongoing research is looking for blood-based biomarkers to identify who is at risk of silent strokes, and surgical interventions to clean up the unstable plaque in the carotid arteries to prevent further cognitive decline.

Besides Drs. Dempsey and Wilbrand, University of Wisconsin collaborators include Dr. Tomy Varghese, Dr. Daren Jackson, Nirvedh Meshram, Dr. Carol Mitchell, Dr. Bruce Hermann, Dr. Sterling Johnson, and Sara Berman.

The [UW Comprehensive Stroke Program](#) coordinates stroke research at about 26 health organizations in Wisconsin and Illinois — ranging from hospital systems to tribal medical centers – in its role as a Regional Coordinating Stroke Center.