

New Cure for Alzheimer's Disease? Non-Invasive High Frequency Sound Waves May Be Effective, Drug-Free Solution



By Mae Chan | [Prevent Disease](#)

The most effective treatment for Alzheimer's Disease is gaining more notoriety and it's drug-free. University of Queensland researchers have confirmed that non-invasive ultrasound technology breaks apart the neurotoxic amyloid plaques that result in memory loss and cognitive decline. The treatment is now being touted as the cure for the debilitating condition that accounts for 70 percent of all cases of dementia.

Alzheimer's Disease (AD) [is not genetic](#). Research is showing the incidence is more correlated to excitotoxins and heavy metals which play a critical role in the development of

several neurological disorders, especially in North America.

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In the last few decades, almost \$40 billion has been spent worldwide on trying to develop a breakthrough drug treatment for Alzheimer's, yet no pharmaceutical approach has worked. We could not produce anything that could slow it down, let alone stop the disease, until now where new research into sound waves is being praised as a possible cure.

AD is a neurodegenerative disorder characterized by progressive cognitive impairment. Although the exact cause of AD remains to be elucidated, we know that its development is associated with brain shrinkage and the formation of characteristic plaques in certain areas. These consist of dead cells and a protein known as amyloid-beta (A-Beta), which aggregates into abnormal fibers that accumulate as toxic clumps outside of cells.

Sounds Waves Not Drugs

Much research into AD has focused on preventing the buildup of these aggregates or clearing them from the brain, but scientists are faced with a problem: The brain is shielded by a delicate layer of cells, known as the blood-brain barrier (BBB), which is very difficult for things to cross, such as therapeutics or helpful antibodies.

[Amyloid plaques](#) sit between the neurons and end up as dense clusters of beta-amyloid molecules, a sticky type of protein that clumps together and forms plaques.

Australian researchers have come up with a non-invasive ultrasound technology that clears the brain of neurotoxic amyloid plaques – structures that are responsible for memory loss and a decline in cognitive function in Alzheimer's patients.

Publishing in [Science Translational Medicine](#), the team described the technique as using a particular type of ultrasound called a focused therapeutic ultrasound, which non-invasively beams sound waves into the brain tissue. By oscillating super-fast, these sound waves are able to gently open up the blood-brain barrier, which is a layer that protects the brain against bacteria, and stimulate the brain's microglial cells to activate. Microglial cells are basically waste-removal cells, so they're able to clear out the toxic beta-amyloid clumps that are responsible for the worst symptoms of Alzheimer's.

[Related Article: Scientists Are Able to Eliminate Alzheimer's Brain Plaque With Ultrasound Waves](#)

The team reports [fully restoring the memory function of 75 percent](#) of the mice they tested it on, with zero damage to the surrounding brain tissue. They found that the treated mice displayed improved performance in three memory tasks – a maze, a test to get them to recognize new objects, and one to get them to remember the places they should avoid.

“We're extremely excited by this innovation of treating Alzheimer's without using drug therapeutics,” said team member Jurgen Gotz. “The word ‘breakthrough’ is often misused, but in this case I think this really does fundamentally change our understanding of how to treat this disease, and I foresee a great future for this approach.”

At UQ's Queensland Brain Institute, Queensland Premier Annastacia Palaszczuk said the findings could have a wide impact for the community.

“The Government's \$9 million investment into this technology was to drive discoveries into clinics, and today's announcement indicates that together with the Queensland Brain Institute, it was a worthwhile investment,” Ms Palaszczuk said.

“We’re also working on seeing whether this method clears toxic protein aggregates in neurodegenerative diseases other than Alzheimer’s and whether this also restores executive functions, including decision-making and motor control.”

Of the 5.4 million Americans with Alzheimer’s, an estimated 5.2 million people are age 65 and older, and approximately 200,000 individuals are under age 65 (younger-onset Alzheimer’s).

Sources:

sciencemag.org

uq.edu.au

sciencealert.com

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