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# Can This 'Fastball' Test Lead to Early Diagnosis of Alzheimer's Disease?



By <u>Kaitlin Vogel</u> on July 11, 2023 — <u>Fact checked</u> by <u>Brittney M. Mikell</u>, <u>PharmD, RPh</u>



MoMo Productions/Getty Images

- A new dementia assessment test known as Fastball EEG has proven to be effective to detect changes in brain waves when a patient remembers an image.
- Fastball is unique because it doesn't require the patient to understand the test, allowing researchers to bypass issues such as education, language and nervousness, which can impact performance on traditional tests.
- Experts agree that Fastball shows promise in the field of dementia diagnosis. Studies are currently underway at a clinic in Bristol to further determine the efficacy of this test.

Early detection is crucial in order to treat and prevent any disease. For Alzheimer's disease, researchers are continuing to explore new avenues for early diagnosis.

The universities of Bath and Bristol were awarded £1.5 million / \$1.9 million funding for a new test to help with the early detection for Alzheimer's disease and dementia. The dementia assessment is called 'Fastball EEG.'

'Fastball' examines patients' brain waves using an electroencephalogram (EEG) headset. Prior studies have demonstrated the effectiveness of Fastball when it comes to detecting changes in brain waves during memory recognition.

Unlike current diagnostic tests which involve personal questions to test an individual's memory, Fastball doesn't require the person to understand the test.

"Fastball is a unique test because it doesn't require the patient to understand the test or provide any response. This helps us to bypass a lot of the confounds that can affect performance on a traditional test. Things like education, language and nervousness can affect anyone's performance on a test, and Fastball's passive nature helps bypass that," Dr. George Stothart, lead author and a cognitive neuroscientist at the University of Bath, told Healthline.

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### Why this test could be a "game changer"

Over the next five years, the team will test Fastball on more than 1,000 patients at a dementia clinic at Southmead Hospital in Bristol.

This will be the largest study to use EEG to test for Alzheimer's disease.

"We have the proof-of-principle that Fastball works, next we're moving it from the laboratory to a clinic that specializes in dementia diagnosis. This will help us understand how Fastball works at scale, and how to improve it, and how best to make it available to the NHS and other healthcare systems," Stothart added.

Dr. Joel Salinas, Clinical Assistant Professor of Neurology at NYU Langone Health and Chief Medical Officer at Isaac Health, an online memory center, explained this research is compelling in a few ways.

Firstly, the use of a completely non-invasive, passive test like Fastball could be a game changer in the early diagnosis of Alzheimer's, given that current methods can be highly subjective and prone to error.

The concept of detecting dementia by measuring changes in brain waves as a person watches images is fascinating and has been an active area of research in the field by various investigators, each coming at this research from their own unique angle.

It is worth noting that while these early signs and similar physiologic markers are encouraging, much more research will be needed to validate the efficacy and reliability of this and similar diagnostic tools, Salinas noted.

"There are several ways to corroborate a diagnosis of dementia. If this method can provide an inexpensive, quick, and painless new method then it could end up being helpful," said Raphael Wald, Psy.D., a neuropsychologist at Baptist Health Marcus Neuroscience Institute.

## What sets Fastball apart from other diagnostic tests

Dementia is often the later-to-end stage of a disease that begins several years to decades before, often silently and insidiously. As a result, dementia and diseases that cause dementia are often not diagnosed until the disease has reached an advanced stage, Dr. Jason Krellman, neuropsychologist and a professor of Neuropsychology at Columbia University Irving Medical Center, explained. Earlier detection could help patients and families by giving them valuable time to address modifiable risk factors for cognitive decline, make future care plans, and seek the highest quality palliative care.

"If effective, a diagnostic test like Fastball EEG would allow for earlier diagnosis in a wider range of patients who might otherwise not be able to access current standard diagnostic services, such as because of cost or lack of specialists and appropriate diagnostic facilities in their area," Krellman stated. "The available data are promising, but further work is needed to fully characterize the diagnostic potential of this technology and its ability to assist in the differential diagnosis of various diseases that cause dementia."

Another benefit of this test is that it's portable.

"The technology's portability, [allows] tests to be conducted anywhere, is an important advantage to be taken into consideration for tests like this," Salinas stated. "If proven successful, it could become a powerful tool in early detection and long-term management of Alzheimer's disease."

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### Additional diagnostic tests

Aside from Fastball, there are other promising diagnostic tools for

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"Biomarker tests that examine beta-amyloid and tau proteins in cerebrospinal fluid or through PET scans are the most direct diagnostic tools we have available," said Salinas. "The development of blood tests that can identify these biomarkers and other types of advanced imaging are also fast-evolving areas of research. These measures could potentially allow for even earlier diagnosis of Alzheimer's."

However, it is important to note that while emerging technologies are promising, they are each at different stages of development, where some need much more study to confirm their accuracy and effectiveness, Salinas added.

### Takeaway

The universities of Bath and Bristol were awarded £1.5 million / \$1.9 million funding for a new test, 'Fastball EEG' to improve early detection for Alzheimer's disease and dementia.

Unlike other diagnostic tests, Fastball is passive, and doesn't require the patient to understand the test. This eliminates issues such as education, language and nervousness, which can influence test results.

Doctors agree that Fastball can prove to be beneficial for diagnosing dementia and Alzheimer's at an earlier stage. That being said, further research is necessary.

### How we reviewed this article:

### () HISTORY

Our experts continually monitor the health and wellness space, and we update our articles when new information becomes available.

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**HEALTH NEWS** 

### This Type of Hidden Belly Fat Linked to **Higher Alzheimer's Disease Risk**

By Gigen Mammoser on November 20, 2023 – Fact checked by Jennifer Chesak, MSJ



Casarsa/Getty Images

- Researchers at the Radiological Society of North America have linked a specific type of body fat to the development of Alzheimer's Disease.
- Obesity is already a risk factor for the development of Alzheimer's, but this is the first time research has linked that risk with a specific type of fat.
- The research opens up new avenues for prevention by focusing treatment on fat loss.

Belly fat in middle age is a predictor of Alzheimer's Disease, according to new research presented by the Radiological Society of North America.

Researchers looked at visceral fat, a specific type of fat that makes up only a small portion of an individual's body mass, but is critically located in the abdominal cavity, in close proximity to many vital organs. Visceral fat is sometimes called hidden fat<sup>©</sup> because it is not visible from the outside.

In a new study presented at the RSNA Annual Meeting, visceral fat was associated with changes in the brain that are an early signal of the development of Alzheimer's Disease.

Dr. Heather M. Snyder, PhD, the Alzheimer's Association's Vice President of Medical and Scientific relations, told Healthline that the study, although small, was important.

"We know there are associations seen in past large studies that connect things like body mass index and obesity with later life risk of memory changes and possibly dementia. This new work seeks to understand the associations of things like obesity and BMI to the brain's structure — and maybe overall health — as it relates to Alzheimer's," she said. Snyder was not involved with the study.

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### 'Hidden' belly fat and the brain

To conduct the study, researchers analyzed data from 54 participants ranging in age from 40-60 years old. All of the participants were cognitively healthy, but clinically obese, with an average BMI of 32. Using MRI scans the team was able to take images of the abdominal cavity and measure the amount of both visceral fat and subcutaneous fat (the more common type of fat found underneath the skin).

The team also took MRI brain scans to observe any potential associations between brain volume and visceral fat. Of particular interest is the thickness of the cortex, which controls important functions like language, reasoning, and memory.

Alzheimer's Disease is known to destroy neurons and their connections<sup>®</sup> in the cortex, resulting in loss of volume or "shrinking" as it progresses.

The researchers also used a battery of other relevant tests that could indicate brain changes or biomarkers for inflammation and Alzheimer's development, including glucose tolerance tests (insulin resistance), and PET scans focusing on amyloid plaques and tau tangles — the "plaques and tangles" that are a hallmark of Alzheimer's.

# Higher amounts of hidden visceral fat linked to more inflammation

Participants with a higher ratio of visceral fat to subcutaneous fat had higher levels of tau and amyloid proteins in their brains identified through the PET scans. A higher ratio of visceral fat was also associated with more inflammation, another risk factor for Alzheimer's.

"Even though there have been other studies linking body mass index (BMI) with brain atrophy or even a higher dementia risk, no prior study has linked a specific type of fat to the actual abnormal Alzheimer disease protein in cognitively normal persons up to 25 years before they would show the earliest symptoms of Alzheimer disease," Dr. Cyrus A. Raji, MD, PhD, an Associate Professor of Radiology and Neurology and Director of Neuromagnetic Resonance Imaging at the Washington University School of Medicine, told Healthline.

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### How to decrease your risk of Alzheimer's disease

And this is good news. Not only does the study help shed more light on one of the biological pathways that can lead to Alzheimer's but also promotes the important message that some of these risk factors can be identified and modified early on.

"We are excited to see these initial findings and look forward to more work and collaborations in this area, with a focus on brain health. The picture on the relationships between body components and brain health is evolving, and we are excited to study the potential mechanisms linking these entities," said Raji.

Lifestyle changes that include eating healthy and increasing exercise can help improve the amount of visceral fat on your body, even if it's not visible to the naked eye. Even if you're not losing weight, aerobic exercise is still good habit for overall health. Be careful though, not all exercise is equal; doing sit ups, for example, might help tighten up your abs, but it isn't going to have a big effect on abdominal fat.

The Alzheimer's Association encourages individuals to try a variety of activities to help keep their brain's sharp, including:

- Exercise
- Reading
- Eating healthy
- Stopping smoking

You can find out more from their guide, "10 Ways to Love Your Brain."

"This is such an exciting time in research, and studies like this will help us better understand these risk-related links," said Snyder.

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### The bottom line

Visceral fat, which is found around in the organs in the abdominal cavity, is linked to other markers that indicate the development of Alzheimer's Disease.

Researchers used brain and body imaging (MRI and PET scans), as well as additional testing to demonstrate the association.

The research encourages individuals to make healthy lifestyle changes, particularly in regard to their weight, earlier in life to help prevent Alzheimer's.

### How we reviewed this article:

### **INSTORY**

Our experts continually monitor the health and wellness space, and we update our articles when new information becomes available.

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