

10 Key Reasons Dementia Is Linked With Diabetes

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The Conversation

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The link between [diabetes](#) and dementia is becoming increasingly clear. New research shows how blood sugar problems affect brain health and vice versa. Here are ten evidence-based insights into how the two conditions are related.

1. Diabetes raises the risk of dementia

People with diabetes are about [60% more likely](#) to develop dementia than those without, and frequent episodes of low blood sugar are linked to a 50% higher chance of cognitive [decline](#).

2. Insulin resistance affects the brain too

Insulin resistance – the major cause of type 2 diabetes – happens when cells stop responding properly to insulin. This means that too much sugar, in the form of glucose, is left in the blood, leading to complications.

It usually affects the liver and muscles, but it also affects the brain. In [Alzheimer's](#), this resistance may make it harder for brain cells to use glucose for energy, contributing to [cognitive decline](#).

3. A brain sugar shortage in dementia

The brain is only 2% of our body weight, but uses about 20% of the body's energy. In dementia, brain cells appear to lose the ability to use glucose [properly](#).

This mix of poor use of glucose and insulin resistance is sometimes unofficially called [type 3 diabetes](#).



Frequent episodes of low blood sugar are linked to a 50% higher chance of cognitive decline.
([Nutrisense Inc/Pexels](#))

4. Alzheimer's can raise diabetes risk

People with Alzheimer's often have [higher fasting blood glucose](#), even if they don't have diabetes. This is a form of pre-diabetes. Animal studies also show that Alzheimer's-like changes in the brain [raise blood glucose levels](#).

Also, the highest genetic risk factor for Alzheimer's, the *APOE4* genetic variant, reduces insulin sensitivity by [trapping the insulin receptor inside the cell](#), where it cannot be switched on properly.

5. Blood vessel damage links both conditions

Diabetes damages blood vessels, causing complications in the eyes, kidneys and heart. The brain is also at risk. High or varying blood glucose levels can injure vessels in the brain, reducing blood flow and oxygen delivery.

Diabetes can also weaken the brain's protective barrier, letting harmful substances in. This leads to inflammation. Reduced blood flow and brain inflammation are strongly [linked to dementia](#).

6. Memantine: a dementia drug born from diabetes research

Memantine, used to treat moderate to severe Alzheimer's symptoms, was originally developed as a diabetes medication. It didn't succeed in controlling blood glucose, but researchers later discovered its benefits for [brain function](#). This story shows how diabetes research may hold clues for treating brain disorders.

7. Metformin might protect the brain

Metformin, the most widely used diabetes drug, does more than just lower blood glucose. It gets into the brain and may [lower brain inflammation](#).

Some studies suggest that people with diabetes who take metformin are less likely to develop dementia, and those who stop taking it may see their [risk increase again](#).

Trials are testing its effects in people [without diabetes](#).

8. Weight-loss injections may reduce plaque buildup

GLP-1 receptor agonist drugs, such as semaglutide (Ozempic, Wegovy), lower blood glucose and support weight loss. Records show that people with diabetes on these drugs have a lower dementia risk.

Comparing GLP-1 drugs to metformin, studies have found that they were even [more effective than metformin](#) at reducing dementia risk.

Two major trials, [Evoke and Evoke Plus](#), are testing oral semaglutide in people with mild cognitive impairment or early mild Alzheimer's.



People with diabetes on GLP-1 receptor agonist drugs have a lower dementia risk. (imyskin/Canva)

9. Insulin therapy might help the brain

Since insulin resistance in the brain is a problem, researchers have tested insulin sprays given through the nose. This method delivers insulin straight to the brain while reducing effects on blood sugar.

Small studies suggest these sprays [may help memory](#) or [reduce brain shrinkage](#), but delivery methods remain a challenge. Sprays vary in how much insulin reaches the brain, and long-term safety has not yet been proven.

10. SGLT2 inhibitors may lower dementia risk

New evidence suggests that compared to GLP-1 receptor agonists, SGLT2 inhibitors, (a type of diabetes drug) are superior at [reducing dementia risk](#), including Alzheimer's and vascular dementia, in people with type 2 diabetes. These tablets lower blood sugar by increasing sugar removal in urine.

This study builds on early evidence suggesting they lower dementia risk by [reducing inflammation in the brain](#).

This growing body of evidence suggests that managing diabetes protects more than the heart and kidneys, it also helps preserve brain function.

Questions remain whether diabetes drugs only reduce the diabetes-associated dementia risk or whether these drugs could also reduce risk in people without diabetes.

However, diabetes research has been very successful in creating at least 13 different classes of drugs, multiple combination therapies, giving rise to at least 50 different medicines. These reduce blood sugar, improve insulin sensitivity and reduce inflammation.

A 'side effect' may be better preservation of brain health during ageing.

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