

Alzheimer's Disease and Type 2 Diabetes: What Is the Link?

Nearly 26 million people in the United States have diabetes. Seven million of them don't even know it.*

What is type 2 diabetes?

Type 2 diabetes, like type 1 diabetes, is a condition in which too much sugar builds up in your bloodstream. In type 2 diabetes, the sugar buildup occurs because your body's cells can't use insulin effectively, your body stops producing enough insulin, or from a combination of these conditions. Insulin is a hormone that helps your cells absorb sugar and turn it into energy.

Who gets type 2 diabetes?

Type 2 diabetes can strike anyone, but it's more common in adults. Some adults have a higher risk than others. You may be at greater risk if you:

- Don't exercise enough
- Are overweight
- Are age 45 or older
- Have a parent or sibling with diabetes
- Belong to one of these ethnic groups:
 - Hispanic American
 - African American
 - Native American
 - Asian American
 - Pacific Islander

How does diabetes affect health?

When diabetes is not controlled, your blood sugar stays too high. Over time, this excess sugar can damage your body. Type 2 diabetes puts people at risk for these illnesses:

- Heart disease
- Stroke
- Blindness
- Kidney failure
- Foot and leg amputation
- Nerve problems
- Blood vessel damage

* National Institute of Diabetes and Digestive and Kidney Diseases. National Diabetes Statistics, 2011.
<http://diabetes.niddk.nih.gov/dm/pubs/statistics/index.htm>

How does type 2 diabetes affect the brain?

Type 2 diabetes can also harm your brain. Compared with people without diabetes, people with diabetes may be more likely to develop dementia. A person with dementia has a harder and harder time remembering things, thinking clearly and carrying out day-to-day activities. The most common dementia is Alzheimer's disease. Another form is vascular dementia. Both Alzheimer's disease and vascular dementia have been linked to diabetes.

How does type 2 diabetes start?

Before getting type 2 diabetes, a person may have blood sugar levels that are somewhat higher than normal but not as high as in diabetes. Slightly elevated blood sugar levels — above 100 mg/dL — are considered prediabetes. When your blood sugar level consistently rises above 126 mg/dL, you're diagnosed with diabetes. Doctors also diagnose diabetes by measuring A1C, another substance in your blood. A1C levels above 6.5 percent indicate diabetes.

In addition to elevated blood sugar, people with prediabetes or diabetes usually have insulin resistance—an inability to use insulin effectively. As insulin resistance develops, your body produces more insulin to compensate. Many people with insulin resistance have high levels of both sugar and insulin in their blood. Over time, your ability to produce insulin may decline, causing your blood sugar to rise even higher.

Insulin resistance often occurs at the same time as a group of other symptoms. Together, these symptoms are known as "metabolic syndrome." In addition to insulin resistance and elevated blood sugar, people with metabolic syndrome often have:

- A big waistline: at least 40 inches for men or 35 inches for women
- Low levels of HDL, or "good" cholesterol: below 40 mg/dL for men or 50 mg/dL for women
- High levels of triglycerides (another blood fat): above 150 mg/dL
- High blood pressure: at least 130/85

What is the diabetes-dementia link?

Doctors don't yet know what causes Alzheimer's disease or exactly how diabetes and dementia are connected. But they do know that insulin resistance, high blood sugar or diabetes may harm the brain in several ways:

- Insulin resistance and type 2 diabetes increase the risk of heart disease and stroke. These conditions hurt the heart and blood vessels. Damaged blood vessels in the brain may contribute to Alzheimer's disease.
- Your brain cells use high levels of energy. Inability to absorb sugar to generate this energy may damage these cells.
- Brain function also depends on many different chemicals. Too much insulin may upset the balance of these chemicals. Some of these changes may help trigger Alzheimer's disease.
- High blood sugar causes inflammation. This may damage brain cells and help Alzheimer's to develop.

Could diabetes medicines help treat or prevent Alzheimer's?

Scientists wonder whether type 2 diabetes medicines or insulin might help prevent or treat Alzheimer's. They are testing some of these drugs to see if they help. In one large clinical trial, a diabetes drug that increases the body's sensitivity to insulin didn't improve memory or thinking in people with Alzheimer's.

How can diabetes be prevented?

Preventing diabetes may not stop dementia. But diabetes is linked to many other health problems. So, preventing diabetes is a good idea in itself.

Work with your doctor to detect the first signs of prediabetes or diabetes. Have your weight, blood pressure, cholesterol, and blood sugar or A1C checked regularly. Even if you develop prediabetes or type 2 diabetes, treating these conditions can help prevent complications.

Three changes can cut your risk of developing diabetes:

1. Lose about 5 – 7 percent of your body weight if you're overweight and have prediabetes. That's just 10 – 15 pounds for someone weighing 200 pounds.
2. Walk or engage in other moderately vigorous exercise for at least 30 minutes five days a week.
3. Eat a healthy, low-fat diet.

The Alzheimer's Association is the leading voluntary health organization in Alzheimer's care, support and research.

Updated April 2011