

# Dementia risk tied to blood sugar level, even with no diabetes

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A joint Group Health–University of Washington (UW) study in the *New England Journal of Medicine* has found that higher blood sugar levels are associated with higher dementia risk, even among people who do not have diabetes.

Blood sugar levels averaged over a five-year period were associated with rising risks for developing [dementia](#), in this report about more than 2,000 Group Health patients age 65 and older in the Adult Changes in Thought (ACT) study.

For example, in people without diabetes, risk for dementia was 18 percent higher for people with an average glucose level of 115 milligrams per [deciliter](#) compared to those with an average glucose level of 100 mg/dl. And in people with diabetes, whose [blood sugar levels](#) are generally higher, dementia risk was 40 percent higher for people with an average glucose level of 190 mg/dl compared to those with an average glucose level of 160 mg/dl.

"The most interesting finding was that every incrementally higher glucose level was associated with a higher risk of dementia in people who did not have diabetes," said first author Paul K. Crane, MD, MPH, an Associate Professor of Medicine at the UW School of Medicine, Adjunct Associate Professor of Health Services at the UW School of Public Health, and Affiliate Investigator at Group Health Research Institute. "There was no threshold value for lower glucose values where risk leveled off."

"One major strength of this research is that it is based on the ACT study, a longitudinal cohort study, where we follow people for many years as they lead their lives," said senior author Eric B. Larson, MD, MPH, a senior investigator at Group Health Research Institute who also has appointments at the UW Schools of Medicine and Public Health. "We combine information from people's research visits every other year with data from their visits to Group Health providers whenever they receive care. And this gave us an average of 17 blood sugar measurements per person: very rich data."

These measurements included blood glucose (some fasting, some not) and glycated hemoglobin (also known as HbA1c). Blood sugar levels rise and fall in peaks and valleys throughout each day, but glycated hemoglobin doesn't vary as much over short intervals. Combining glucose and glycated hemoglobin measures into a composite measure required special statistical techniques, which Drs. Crane and Larson's co-authors Rod Walker, MS, a biostatistician, and Rebecca Hubbard, PhD, an associate investigator, both from Group Health Research Institute, had developed. (Dr. Hubbard is also an Affiliate Assistant Professor of Biostatistics at the UW School of Public Health.) These sophisticated statistical models required specialized data on the relationships between glycated hemoglobin and glucose levels, and they used data generated by co-author David M. Nathan, MD, a Professor of Medicine at Harvard Medical School and Director of the Diabetes Center at Massachusetts General Hospital.

So should people try to eat less sugar—or foods with a lower "glycemic index"? Not necessarily, Dr. Crane said: "Your body turns your food into glucose, so your blood sugar levels depend not only on what you eat but also on your individual metabolism: how your body handles your food." But he does suggest that taking walks couldn't hurt: The ACT study has previously linked physical activity to later onset and reduced risk of dementia, including Alzheimer's disease.

Furthermore, Dr. Crane emphasized that these results come from an observational study: "What we found was that people with higher levels of glucose had a higher risk of dementia, on average, than did people with lower levels of glucose," he said. "While that is interesting and important, we have no data to suggest that people who make changes to lower their [glucose](#) improve their dementia risk. Those data would have to come from future studies with different study designs."

More research is planned to delve into various possible mechanisms for the relationship between [blood sugar](#) and dementia. "This work is increasingly relevant," Dr. Crane said, "because of the worldwide epidemics of dementia, obesity, and diabetes."

Provided by Group Health Research Institute

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