

Elderly diabetes patients with very low glucose levels have slightly increased risk of death

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A new study of older diabetes patients has found that well-controlled blood sugar levels were associated with a lower risk of major complications such as heart attacks, amputation and kidney disease, but the very lowest blood sugar levels were associated with a small but significant increased risk of death. The study published in the June 2011 issue of the journal *Diabetes Care*, followed more than 70,000 type 2 diabetes patients from Kaiser Permanente who were over 60 years of age for four years.

Because these findings come from an observational study and not a randomized clinical trial, more research needs to be done to fully understand their clinical implications.

"We saw increased [mortality](#) and complications, as anticipated, among those with very high blood sugars, but we also saw a modestly increased risk of death among those with very low levels of [blood sugar](#)," said the study's lead author Elbert Huang, MD, associate professor of medicine at the University of Chicago. Researchers indicated that the best overall outcomes were found among those with intermediate levels of control

Huang and Andrew Karter, PhD, from Kaiser Permanente Division of Research in Oakland, CA, jointly lead the Diabetes & Aging Study, the largest observational study to assess diabetes in older adults in the United States. The 5-year, NIH-funded study investigates care and health

outcomes in older patients with [type 2 diabetes](#) in a typical community setting.

Most current guidelines suggest keeping glucose levels for patients with diabetes quite low. For people without diabetes, the normal glucose level—measured by a test called hemoglobin A1C, which reflects the average blood glucose level over the previous three months—is between 4 percent and 6 percent, compared to 6 and higher for patients with diabetes.

Because higher levels are associated with complications from this chronic disease, most recommendations for people with diabetes suggest maintaining an A1C less than 7 percent

"We need more evidence regarding how well the 7-percent guideline, which was based on a 1998 British trial that excluded older patients, applies to patients over the age of 60," said study co-author Andrew J. Karter, PhD, and the study's principal investigator at the Kaiser Permanente Division of Research.

Recent studies have raised concerns. In 2008, the Action to Control Cardiovascular Risk in Diabetes (ACCORD) trial was halted after it showed a higher rate of mortality in older patients who received very intensive glucose-lowering treatments.

"In our study," said Huang, "we found the best overall outcomes among those with the intermediate levels of control, those with A1Cs below 8 percent but above 6 percent. We observed similar patterns for those in their 60s, 70s, and over 80."

Finding the optimal A1C target is a balancing act, the authors note. The risk of all complications rose with [blood sugar levels](#), but those with an A1C between 6 and 8 percent had the lowest death rates. While those

with very poorly controlled blood sugars—A1C over 10 percent—had the highest rates of death, those with an A1C below 6 were also at a somewhat higher than those with an A1C between 6 and 8 percent.

"We cannot say whether this unexpected finding is due to the very low blood sugar itself, the treatments used to control blood sugars, or to some other factors not directly related to the care of diabetes," Karter explained. "It may be that the sickest patients at high risk of dying simply had low blood sugars to start with, rather than anything directly associated with the care of [diabetes](#) increasing the risk of death."

"Further research, he added, "will be focused on identifying the mechanisms that underlie the somewhat increased mortality among those with very low A1C."

Provided by University of Chicago Medical Center

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