

In Type 2 Diabetes, Metabolic Control Could Add Years to Life

Controlling four biomarkers could add as much as a decade to life expectancy

by [Kristen Monaco](#), Staff Writer, MedPage

People with diabetes who hit treatment goals for metabolic measures tacked years onto their life expectancy, a modeling study suggested.

Among 421 individuals with type 2 diabetes, those who started in the highest quartile for hemoglobin A1c (averaging 9.9%) and reduced their level down to a normal level (average HbA1c 5.9%) were able to add on 3.8 years to their life expectancy, reported Hui Shao, MD, PhD, of the University of Florida in Gainesville, and colleagues.

Individuals with the highest HbA1c levels who were able to reduce their levels down to the third quartile (an average of 7.7%) had a 3.4-life year gain, the group wrote in [JAMA Network Open](#).

Though not as dramatic, patients who were able to reduce their HbA1c from an average of 7.7% down to 6.8% (the second quartile) still added half a year to their life expectancy.

However, those who cut their HbA1c level from 6.8% down to 5.9% (the first quartile) didn't seem to add any years to their life.

Hitting other metabolic goals also appeared to tack on years to life expectancy for these individuals, as well. As for BMI, those in the lowest three quartiles for average BMI saw several life years gained when compared with those in the highest quartile who had an average BMI of 41.4 (severe obesity):

- Average BMI 33.0 (third quartile): 2.0 additional life-years
- Average BMI 28.6 (second quartile): 2.9 additional life-years
- Average BMI 24.3 (first quartile): 3.9 additional life-years

Similar patterns were seen with blood pressure. Compared with the highest quartile of systolic blood pressure (SBP, averaging 160.4 mm Hg) lower levels of 114.1 mm Hg (first quartile), 128.2 mm Hg (second quartile), and 139.1 mm Hg (third quartile) were associated with 1.9, 1.5, and 1.1 life-years gained, respectively.

Lower LDL cholesterol (LDL-C) levels were also associated with a few months gained in life expectancy. Compared with those who fell into the highest quartile averaging 146.2 mg/dL, those with average levels of 59 mg/dL (first quartile), 84.0 mg/dL (second quartile), and 107.0 mg/dL (third quartile) were associated with 0.9, 0.7, and 0.5 years gained in life expectancy.

"Our findings can be used by clinicians and patients in selecting optimal treatment goals, to motivate patients in achieving them, and to measure potential health benefits for interventions and programs to improve diabetes care in the U.S.," Shao's group recommended.

"Better control of biomarkers can potentially increase the life expectancy [LE] by 3 years in an average person with [type 2 diabetes] in the U.S.," they wrote. "For individuals with very high

levels of HbA1c, SBP, LDL-C, and BMI, controlling biomarkers can potentially increase LE by more than 10 years."

This message is especially true for younger patients with type 2 diabetes, as the benefits of biomarker control were most pronounced in this age group, Shao's group pointed out. The magnitude of life expectancy benefits appeared to diminish for older patients and varied slightly according to sex.

"[A] woman aged 50 to 60 years old with BMI 30, SBP 160 mm Hg, and HbA1c 10% can expect to live an additional 3.0 years by reducing her SBP to 120 mm Hg and can gain 1.2 years through reducing BMI to 25," the researchers explained. "For a male patient aged 50 to 60 years with BMI 35, SBP 160 mm Hg, HbA1c 8%, and LDL-C 130 mg/dL, reducing BMI from 35 to 30 was associated with an additional 1.4 years of LE."

"However, for a male patient aged 70 to 80 with the same levels of biomarkers, reducing BMI to 30 kg/m² was only associated with an additional 0.6 years of LE," they wrote.

For this decision analytical model, the researchers utilized the Building, Relating, Assessing, and Validating Outcomes (BRAVO) diabetes microsimulation model that drew upon data of adults with type 2 diabetes from the 2015-2016 cycle of the National Health and Nutrition Examination Survey. This data was then compared with short-term mortality data from the National Death Index. The average age of the participants was 65.6, and 46% were women.

Each of the four biomarker categories were divided evenly into quartiles, with averages from each of the four groups used for the final analysis:

- HbA1c: under 6.4%, 6.4%-7.2%, 7.3%-8.2%, and over 8.2%.
- SBP: under 122 mm Hg, 122-132 mm Hg, 133-144 mm Hg, and over 144 mm Hg
- LDL-C: under 73 mg/dL, 73-96 mg/dL, 97-122 mg/dL, and over 122 mg/dL
- BMI: under 27, 27-31, 32-36, and over 36

One limitation to the analysis was that end-stage kidney disease was not included as a variable in the BRAVO model, which could possibly overestimate life expectancy, Shao's group said. Other limitations were lack of inclusion of other biomarkers like triglycerides and exclusion of type 2 diabetes patients with a history of cardiovascular disease.

[Kristen Monaco](#) is a staff writer, focusing on endocrinology, psychiatry, and nephrology news.

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