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Strict Control Key to Taming Diabetes

Study Finds Aggressive Treatment Halves Risk of Heart Attack and Stroke

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Diabetics who tightly control their blood sugar levels can cut their risk of heart attacks and strokes in half, a long-awaited federally funded study shows.

The findings, from nearly 1,400 diabetics who have been followed for more than a decade, provide the first direct evidence that the risk of the most serious complications of the disease, which affects millions of Americans, can be minimized by aggressive treatment, experts said.

"This is the most important diabetes news of the year," said David M. Nathan of Harvard Medical School in Boston, who co-chaired the study, published in today's issue of the *New England Journal of Medicine*. "This is the remaining piece of the puzzle with regard to our ability to take the teeth out of diabetes and make it a less dangerous disease."

Nearly 21 million Americans have diabetes, and the number is rising because of the increasing number of elderly and obese people.

Diabetics' bodies are unable to control the amount of sugar in their blood. Over time, elevated sugar levels can cause damage throughout the body, making diabetics prone to a variety of health problems that include blindness, kidney failure, nerve damage that sometimes requires amputations, and, most seriously, heart attacks and strokes.

In 1993, Nathan and his colleagues revolutionized the treatment of the disease when they reported the results of the landmark *Diabetes Control and Complications Trial*, in which 1,441 patients with Type 1 diabetes were put on either conventional treatment or a strict regimen aimed at tightly controlling their blood sugar, beginning in 1983.

When the study began, the practice of most diabetics was to test their blood sugar once a day and give themselves one or two insulin injections daily. The strict regimen used in the study involved multiple blood sugar tests every day and a minimum of three insulin injections or the use of an insulin pump.

The results, hailed as the most important development in diabetes since insulin, showed that after about six years the strict regimen sharply reduced the risk of the most common complications: eye, kidney and nerve damage. As a result, most doctors began to advocate the aggressive treatment approach and many patients adopted the more difficult lifestyle.

But that study was too short to determine whether strict blood sugar control would also reduce the risk of heart disease, which kills 75 percent of diabetics. For the new study, researchers continued to follow 1,394 subjects from the original study until Feb. 1, 2005, to determine the impact of strict control on

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heart disease and stroke.

The diabetics on the strict regimen were 42 percent less likely to experience any kind of heart problem and 57 percent less likely to suffer the most serious problems, such as heart attacks or strokes, the researchers found.

"That's a pretty dramatic reduction," Nathan said. "Short of curing diabetes, this is one of the final answers in the puzzle as to whether we can decrease the complications from the disease. This adds something very important to the list of things we know we can improve."

The findings should push more doctors to encourage their patients to embrace the aggressive approach, and more diabetics to work harder at controlling their blood sugar levels, experts said. Despite the 1993 findings, many diabetics fail to tightly control their blood sugar.

"This shows that it is really important both for physicians and patients to really focus on this," said Judith E. Fradkin of the National Institute of Diabetes and Digestive and Kidney Diseases, which funded the study. "It requires eternal vigilance, and it's hard. But this is pretty definitive evidence of the value of making that effort."

About 5 to 10 percent of diabetics suffer from the Type 1 form of the disease, which usually begins in childhood and is caused by a breakdown in the body's ability to make insulin. Accumulating evidence suggests patients with the more common Type 2 form of the disease, in which the body either cannot produce enough insulin or cannot use it adequately, are likely to experience similar benefits, experts said. Research has already shown that tight blood sugar control strongly protects Type 2 diabetics against eye, kidney and nerve damage and reduces their risk of heart disease.

"This helps build the case that improving control of blood sugar levels does in fact improve the risk for cardiovascular disease for both Type 1 and Type 2 diabetes," said Robert Rizza, president of the American Diabetes Association. "This has important implications for large numbers of patients."

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