

## ***Intensive Glycemic Control Yields Big Cardiovascular Benefits*** by the National Diabetes Education Program



Intensive glucose control in people with diabetes reduces the risk of heart attacks and strokes *by more than half*. Intensive therapy should start early, and yields benefits for years.

That's the take-home message from the NIH-sponsored Epidemiology of Diabetes Interventions and Complications (EDIC) study—the long-term follow-up of patients in the landmark Diabetes Control and Complications Trial (DCCT).

From 1983 to 1989, the DCCT randomly assigned 1,441 people with type 1 diabetes to either an *intensive* or *conventional* treatment group. Those in the intensive group received at least three insulin injections a day and were required to self-monitor their own glucose levels regularly. Those in the conventional group received one or two insulin injections a day with daily urine or blood glucose testing. By the end of trial, A1C readings averaged 7.4 percent in the intensive group and 9.1 percent in the conventional group. The DCCT ended in 1993 after conclusively demonstrating that intensive treatment yielded lower rates of retinopathy, neuropathy, and nephropathy.

In 1994, the vast majority of DCCT participants were enrolled in EDIC. This follow-up study simply tracked participants' health; no interventions were carried out. Insulin treatment regimens obtained from participants' own physicians were not significantly different between groups. During the 11 years of the EDIC follow-up, A1C values between the two groups converged:  $8.0 \pm 1.2$  in the intensive group and  $8.2 \pm 1.2$  in the conventional group ( $p=0.03$ ).

And yet the differences in complications between the two original groups continued to diverge. More than a decade after they left the DCCT and returned to the care of their own doctor, participants are benefiting from what appears to be a metabolic memory of their approximately 6.5 years of intense glucose control. They continue to be protected against cardiovascular disease, as well as retinopathy, nephropathy, and neuropathy. EDIC findings reported in the December 22, 2005 issue of the *New England Journal of Medicine* included:

- During a mean follow-up of 17 years, there were 46 cardiovascular events among 31 patients assigned to the DCCT's intensive group versus 98 events among 52 patients in the conventional group.
- Patients in the intensive group show a 42 percent reduction in the risk of any cardiovascular disease ( $p=0.02$ ) and a 57 percent reduction in the risk of nonfatal myocardial infarction, stroke, or death from cardiovascular disease ( $p=0.02$ ).

This is dramatic confirmation of the role of glucose control—independent of blood pressure and cholesterol—in reducing the rate of cardiovascular disease in people with type 1 diabetes.

What about people with type 2 diabetes? There is strong and growing evidence that people with type 2 diabetes also benefit from intensive glucose control. The United Kingdom Prospective Diabetes Study (UKPDS) demonstrated that glucose control yields similar microvascular benefits among people with type 2 diabetes, and researchers expect that a definitive answer on macrovascular complications will come from the Action to Control Cardiovascular Risk in Diabetes (ACCORD) trial, a major study testing ways to lower the risk of CVD in adults with type 2 diabetes. Results of this study, sponsored by the National Heart, Lung, and Blood Institute (NHLBI) and co-funded by the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK), are due in 2009.

Achieving and maintaining glucose control isn't easy. The latest data from the Centers for Disease Control and Prevention (CDC) suggest that fewer than 45% of Americans with diabetes are achieving the level of glucose control recommended by the American Diabetes Association. EDIC findings should motivate both patients and their health care providers to strive for improved control.

The National Diabetes Education Program (NDEP)'s *Control Your Diabetes. For Life.* campaign materials teach people with diabetes how to *know their ABCs*—what their A1C, Blood pressure, and Cholesterol numbers *are*, what they *should be*, and how to work with their health care team to *reach those goals*. NDEP, a joint program of the National Institutes of Health and the Centers for Disease Control and Prevention, provides copyright free, science-based materials backed by the federal government.

For more information about our *Control Your Diabetes. For Life.* campaign, please visit the National Diabetes Education Program at <http://www.ndep.nih.gov> or call us at 1-800-438-5383.