

# The Seven Percent Solution



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When it comes to type 2 diabetes, anyone still arguing that genes are more important than environment, or vice versa, really hasn't been paying attention. Nature vs. nurture was a lovely debate fifty years ago, but we know now that complex traits like diabetes require inputs from both inside and out. To a degree, you can be forgiven for thinking that genes are the dominant players, given the enormous strides made recently with the sequencing of the human genome and all the scientific and media attention lavished on each new discovery of links between specific genes and diabetes. All those data are true, and the excitement in the scientific community is largely justified--type 2 diabetes has been a tough nut to crack and it looks like some of its genetic secrets are finally being revealed.

Let's not forget, however, that the rate at which we detect diabetes in the American population is skyrocketing, reaching 8-9% of all adults and a frightening number of kids as well. No one would argue that we've changed our genes in the last generation, so something else must be to blame. In fact, there's a large body of evidence pointing to our sedentary lifestyles and diets rich in fats. There's no mystery here--even Hippocrates knew that overweight people are more likely to have diabetes, and the rate of obesity and type 2 diabetes have climbed in parallel in our society. It's also well known that losing weight can improve diabetes, sometimes dramatically. Almost all physicians treating diabetics have at least a few stories about patients re-dedicating themselves to losing weight, and finding that they no longer need insulin or other antidiabetic medications.

What we didn't know was whether losing weight by diet and exercise could **prevent** type 2 diabetes in those at risk. In order to figure this out, the National Institutes of Health has spent close to \$175 million to study 3,234 people in a large trial called the Diabetes Prevention Program (DPP). The DPP announced its

people had a condition called impaired glucose tolerance, which means that they have normal blood sugars when fasting, but their sugar rises too high and stays up too long when they eat a test dose of glucose.

Next, they assigned these people to one of three plans. In the first, patients adopted a series of changes in their diet and exercise patterns, so that they reduced their fat intake and exercised 150 minutes each week. The goal for this group was to lose 7% of their body weight, which by and large they were able to do. The second group got some basic information on diet and exercise, but no specific regimen to follow. Instead, they received the drug metformin (Glucophage™), which is used to make the body more insulin sensitive. The third group got off with the least to do, getting the same generic advice about diet and exercise as the second group, but the pills they took were placebos. The researchers then waited three years to see what would happen.

The results were so important and clear that the study was actually terminated a year early so that they could be announced to the waiting medical world. Twenty-nine per cent of the patients in the last group, who received neither an intensive diet and exercise plan or the drug, developed type 2 diabetes. In contrast, only 14% of patients who did the diet and exercise plan developed diabetes. The patients taking metformin also benefited, but not as much as the diet and exercise folks, as 22% of them went on to get type 2 diabetes.

While we don't know whether those people who prevented the onset of diabetes will have lasting benefit, it seems reasonable to expect that they will do well as long as they keep their extra weight off.

The lessons of the DPP are clear. First and foremost, the amount of weight loss that reduced diabetes by more than half was not overly daunting. Seven percent of body weight for a 200 pounder is only 14 pounds. For a 180-pound person, only 12 and 1/2 pounds need to be shed. This isn't enough weight loss to satisfy most people's cosmetic notions, but it's apparently enough to help dramatically reduce your chances of developing a very serious illness. Secondly, we probably ought to shift some of our focus onto patients who don't yet have diabetes, but who have risk factors for getting it in the future. It's been estimated that 10 million Americans fit the criteria used by the DPP. Finally, the DPP puts some of the recent genetic discoveries in perspective--it's not just the genes you're dealt that matter, but how you treat them as well.

**References:**