Beating Diabetes

The First Complete Program Clinically Proven to Dramatically Improve Your Glucose Tolerance

David M. Nathan, M.D.
Director, Diabetes Center, Massachusetts General Hospital

Linda M. Delahanty, M.S., R.D.
Chief Dietitian, Diabetes Center, Massachusetts General Hospital

Based on groundbreaking scientific studies
Bob’s Tale
Lessons from Sandra’s, Kathy’s, and Bob’s Experiences
Fat and Calorie Goals
Meal Replacements
Tips for Avoiding Dieting Pitfalls
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To my brothers, Ed and Dan

David Nathan

For my husband, Paul, who supports me;
my sister Joanne who inspires me;
and my parents, John and Helen,
who would be so proud.
Linda Delahanty
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The clinical research that forms the basis of this book is the result of the collaborative effort of many investigators around the world. In particular, our colleagues in the Diabetes Prevention Program, the Look: AHEAD study, and the Diabetes Control and Complications Trial have not only advanced the cause of medical science, they have taught us. Finally, the heroes of this story are the research volunteers. Their selfless dedication to answering important medical questions reminds us of the very best qualities that distinguish us from other species.
Introduction

Like many diseases, diabetes is caused by our genes and our personal environment, which is created by our lifestyle. We cannot yet modify our genes, but we can modify our lifestyle. Here at Harvard and in medical centers around the world, we and many colleagues have conducted studies involving thousands of people who were at risk for developing diabetes or who had diabetes. That research proved that changes in lifestyle—changes that anyone can make—have enormous power both to prevent and to help treat diabetes.

That is why we wrote this book. We want to share the information from scientific studies with you so that you can make the best choices for your health, whether you have already been diagnosed with diabetes, have been told that you are at risk for it, or simply want to be as healthy as you can be. You are probably bombarded on a daily basis with advertisements, infomercials, and other advice regarding your health. Our message is based on the most up-to-date scientific data available.

Enormous changes in lifestyles have occurred in the past century. For much of the world’s population, subsistence lifestyles, characterized by farming, hunting, and other occupations in which substantial energy had to be expended to obtain food—or the currency to obtain food—have given way to lifestyles in which little physical effort is needed to obtain nutrition. Farming, hunting, and fishing have been replaced by efficient mass production of food with near unlimited quantities available in most places in the world for little effort or expenditure of energy. As machines and automation have improved, physical labor in factories and trades has been progressively replaced by white-collar jobs. Travel has been made increasingly effortless, threatening to make our feet vestigial organs, except for the need to operate the gas pedals of our cars.

Obviously, the industrial revolution and the technological-computer revolution that followed it have had spectacular benefits for much of the world. However, the changes in lifestyle accompanying these revolutions have a dark side that has spawned epidemics of obesity and diabetes. The consequences of these conditions, including the increasing occurrence of hypertension, abnormal lipid metabolism, and cardiovascular disease, have become the major health problems for much of the world’s population in the twenty-first century. These chronic, degenerative diseases have replaced, to a great extent, the infectious diseases of the past two thousand years—such as tuberculosis, cholera, malaria, and the plague—as the major causes of illness and death in North America and Europe and, increasingly, in Asia, Africa, and South America. The pandemic of obesity, diabetes, and heart disease, based on changes in lifestyle, poses the greatest threat to our survival for the foreseeable future.

The major goals of this book are to provide you with a practical understanding of how today’s typical lifestyle has led to these problems and to give you strategies that have been proved in clinical studies to improve health for people with diabetes or at risk for it. We will focus on practical changes you can make in how you shop for food, how you plan your meals and snacks, how you cook your food, and even how you look at eating, as well as changes in physical activity that have been shown to decrease weight and make a real difference in diabetes, obesity, and cardiovascular disease. In addition, we will discuss the complex interactions between lifestyle and diabetes, and
the adjustments of lifestyle and medical treatment that should be made if you or someone you care about has type 1 or type 2 diabetes.

We have both spent our careers developing, studying, and teaching the lifestyle changes that are discussed here. We believe fervently that the program we offer works and can be one of the best things you can do to preserve and even improve your health. All of our recommendations are based on scientific evidence and practical experience and are the choices that are most likely to improve your prospects for long-term health.

The battle against the damaging effects of our current lifestyle is often framed as a cultural war against the manufacturers and sellers of processed foods, drive-through nutrition, all-you-can-eat buffets, supersized meals, and processed meals that are high in fat and calories. Similarly, television and computer games are often blamed for our lack of exercise.

There is a measure of truth to this. Marketing can be quite powerful. However, in the end, we are responsible for the lifestyle choices we make. In this book, we will provide you with proven strategies that you can use to prevent and help treat diabetes—specific approaches to shopping, cooking, eating, and activity and exercise. The strategies do not require superhuman willpower, an unreasonable amount of time, or more money. They require only that you make a conscious commitment to your health and to the health of your family.
CHAPTER 1
The Basics: Diabetes and Prediabetes and Why They Are on the Rise

The number of people suffering from type 2 diabetes and related conditions has skyrocketed over the past fifty years. And more and more people have blood-sugar levels that, while not high enough to qualify as diabetes, are too high for good health. This condition goes by the name glucose intolerance, or prediabetes.

If you have normal blood sugars or prediabetes, the program in this book will help you protect your health and perhaps stave off diabetes and its serious long-term complications completely. And if you already have type 2 diabetes, this program can help you take control of your condition, improve your blood-sugar levels, and perhaps enable you to cut back on some of your medications. What you’re about to learn is a program for living. It isn’t based on drastic changes or extreme recommendations for diet and exercise. It is about reversing lifestyle history.

This chapter will begin by explaining what diabetes is, how we normally handle the nutrients in our food, and how disturbances in metabolism can affect your overall health. Then we’ll discuss why we’re facing an epidemic of obesity, prediabetes and diabetes, and heart disease. When you understand how pivotal lifestyle is to these conditions, you’ll understand how and why this program can make a difference.

Blood Sugar and Insulin: The Basics

You need to know a little about normal metabolism to understand how so many of us are developing prediabetes and then diabetes. Metabolism represents the body’s processes that direct energy into storage, such as in fat, or into fueling normal growth, development, and physical activity. Carbohydrates (including complex starches and simple sugars), fat, and protein are the three nutrient groups in our diet that provide the energy and building blocks for metabolism and growth. Carbohydrates and fat provide most of the energy to keep our body’s machinery working, including our muscles for locomotion and our vital organs such as brain, liver, heart, lungs, and kidneys.

Carbohydrates are broken down in the intestine into smaller sugars that can be absorbed into the circulation. (See Figure 1.1.) Sugar or glucose is then transported from the blood across the cell wall and into the cell where it is broken down further, providing a major source of energy. Alternatively, sugar may be stored in the liver or muscle as glycogen, which is a complex carbohydrate that serves as an energy reservoir in times of energy need. Fatty acids, a breakdown product of dietary fat, are the other major sources of energy. Like glucose, they may provide instant energy for cells or may be stored as fat for later energy release.

FIGURE 1.1 Digestion
For sugar to gain entry to most cells, it must be carried across the cell wall by glucose transporters. This is where insulin first comes into play.

Insulin is a hormone, which means it is a protein that is made and secreted by specialized cells and then circulates in the bloodstream and affects other organs and their function. Insulin is made in the pancreas, an organ located in the back of the abdomen. Most of the pancreas makes digestive chemicals that help break down nutrients from your food so that they can be absorbed in the intestine. The pancreas also contains small clusters of cells called “islets.” Although different types of specialized cells are in the islets, the most important are the beta cells that make insulin.

These beta cells can sense the level of sugar in the blood, for example after a meal. When blood-sugar level starts to rise, the beta cells make and secrete insulin, which increases the transport of sugar into the cells and keeps the blood-sugar level from rising too high. But the work of insulin has only just started at that point. Insulin also stimulates the processes in the cells that direct the storage of sugar as glycogen, the storage of fatty acids as fat, and the use of amino acids, the building blocks of proteins. In addition, insulin prevents protein breakdown, fat breakdown, and glycogen breakdown. Therefore, insulin directs the storage of energy and stimulates the building of
tissue and growth. (See Figure 1.2.)

**FIGURE 1.2** Normal Glucose Absorption

When blood-sugar levels fall, insulin production and secretion shut down and all of the processes are reversed: sugar is released from the storage depot instead of stored in muscle and liver; fat is broken down and fatty acids released; and proteins are broken down rather than synthesized. Insulin is like a traffic cop, directing nutrients into storage and growth. When insulin levels are low, the traffic moves in the opposite direction with energy released from its storage sites.

This is what happens in a healthy person. When something disrupts any part of this finely tuned system, there is trouble. [End of Sample]