

CHAPTER 1

POWER OF THE KETOGENIC DIET: PERSONAL STORIES

We think real results are of great interest to all, so here we share a few stories of people who have used a ketogenic diet to improve their diabetic health outcomes in powerful ways. As one of the authors of this book and a physician who treats kidney issues associated with diabetic complications, Dr. Runyan's story is particularly compelling.

KEITH R. RUNYAN, M.S., M.D.

In 1998 at the age of 38, I was diagnosed with type 1 diabetes, also called latent autoimmune diabetes in adults (LADA). Once the diagnosis was made, I treated my diabetes with multiple insulin injections and frequent blood sugar monitoring with the advice of endocrinologists along the way. Neither I nor my endocrinologists gave any thought to a change in diet since I was already following a "healthy" dietary regimen as recommended by the American Diabetes Association (ADA) and we were pleased that my hemoglobin A1c (HbA1c) tests were hovering between 6.5% and 7% most of the time. Although my HbA1c values were in the recommended range (< 6.5 – 7%), they were certainly not normal (something closer to 4.2 – 5.6%) and there was no assurance that I would not develop long-term diabetic complications at some point.



I was having two to five hypoglycemic episodes each week, which I thought were just part of having fairly well controlled diabetes. My hypoglycemic symptoms ranged from clothes-soaking sweat, rapid and pounding heartbeat, blurred or double vision, transient numbness of skin, and many other symptoms that varied from episode to episode. The most bothersome were the mental symptoms of hypoglycemia. These included an inability to recognize that I was hypoglycemic and therefore not aware that I needed to treat it. It also manifested itself as being argumentative with my family when they told me to take sugar and I felt I did not need any.

Hypoglycemia was an embarrassing event since it meant a lack of control and was worsened by the fact that I am a physician and should have all the resources and knowledge to avoid it. More importantly, hypoglycemia can be life-threatening and

although I never lost consciousness, had a seizure, needed assistance, or had to be hospitalized, there was no assurance that any of those things would not happen while I was treating my diabetes using conventional therapy.

I was constantly thinking about how I was feeling and whether how I felt could be yet another symptom of hypoglycemia. While lying down to sleep, I wondered whether I would be awakened in the night in a sweat from yet another episode of low blood sugar. There was a three to four month period when my glucose meter was unknowingly reading falsely high. This caused me to overdose insulin and resulted in nightmarish hypoglycemic episodes so severe that I felt like I might die. Fortunately, I was able to manage them myself without needing assistance. I finally purchased a new glucose meter which put an end to these death defying episodes. After those experiences I checked the meter reading against laboratory glucose results, purchased new meters on a more regular basis, and sought out the most accurate meters to purchase.

What I didn't know then was that controlling diabetes with the ADA's high-carbohydrate diet without having recurrent hypoglycemia is impossible! After all, who would have imagined that respected diabetes experts would recommend an impossible task! Do you think I'm still angry? You bet. Having recurrent symptomatic hypoglycemia is certainly not a good way to go through life, especially since it can be avoided!

In August 2007 at the age of 47, I decided to start exercising since I knew I had a chronic disease that might be helped by regular exercise. I decided to start training regularly to complete a sprint triathlon: 0.9-mile swim, 10-mile bike, and 3.1-mile run. Having a goal to work toward provided additional motivation. I completed my first sprint distance triathlon in December 2007. After a few years of increasing the distance of the triathlon events, I contemplated doing the full ironman distance triathlon. I started looking into how to keep my body fueled and blood sugars near normal for the duration of the event, particularly since sugar is the primary fuel used by most athletes during a long distance triathlon. I was consuming sugar in order to prevent hypoglycemia to the point that I was having hyperglycemia (high blood sugars) more often than not. My HbA1c, a test of average blood sugar over time, had increased to as high as 7.9% as a result, and I feared it would reverse any benefit of exercise.

In 2011, I signed up to enter an ironman distance triathlon that consisted of a 2.4-mile swim, a 112-mile bike ride, and a 26.2-mile marathon run. Due to my frequent hyperglycemia while consuming sugar, and the constant threat of hypoglycemia, I felt I needed a new approach. That same year, I was listening to a triathlon podcast, [IM Talk](#), hosted by John Newsom and Bevan James Eyles in which they interviewed Loren Cordain,

Ph.D. That interview introduced me to the concept of diseases of Western civilization. Briefly stated, people who have never been exposed to foods created by agriculture and technology (mainly highly refined sugars and starches, including sweets, flour, white rice, and fruit preserves) rarely develop chronic diseases like dental caries, diabetes, hypertension, heart disease, obesity, dementia, cancer, appendicitis, and peptic ulcers. As a physician, this came as quite a shock to me. One would think that physicians who spend their entire careers treating chronic diseases would have been taught this in medical school. Soon after I heard Jimmy Moore's *Living la Vida Low Carb* [podcast interview](#) with Dr. Richard K. Bernstein, a diabetes specialist in New York who also has type 1 diabetes. After obtaining one of the first blood glucose meters available, he discovered by trial and error that carbohydrates had the greatest influence on his blood sugars, and that a ketogenic diet containing less than 30 grams carbohydrate per day normalized his blood sugars.

From the tenets of *The Paleo Diet* as described by Dr. Cordain, I placed more emphasis on using real whole foods and paid more attention to the source of foods. I added grass-fed beef, free range pastured chicken, pork, liver, and wild fish to my diet. This doesn't mean one can't have success with conventionally sourced foods, but I appreciated some of the significant differences that grass-fed and pastured foods had to offer.

Still skeptical that conventional medicine could possibly be so wrong, I was on a mission to both verify what Dr. Cordain was saying and to learn more about how nutrition affects health and disease. I read Gary Taubes' book *Good Calories, Bad Calories* on the history of diseases of Western civilization, the origin of the low-fat diet, lipid-heart and carbohydrate hypotheses, and evidence supporting the role of dietary refined carbohydrates and sugar in the causation of chronic diseases. I read Dr. Bernstein's *Diabetes Solution* which describes his method of using the ketogenic diet to treat diabetes, and many other books and articles, including many cited in this book. I wanted to make sure that the information I was obtaining was accurate since I was changing my own treatment in opposition to current medical convention.

I also utilized information from *The Art and Science of Low Carbohydrate Living* and *The Art and Science of Low Carbohydrate Performance* by Stephen Phinney, M.D., Ph.D., and Jeff Volek, Ph.D., R.D. When I learned that their information was accurate, I became angry. Why did I not take the initiative to find this out for myself sooner? Why didn't the world's leading diabetes experts and organizations find this out or mention it as an option? Why didn't the research funding organizations support studies to test the carbohydrate hypothesis? How could so many scientists and physicians come to believe that a diet with 6 to 11 daily servings of bread, cereal, rice, and pasta is a "healthy" diet, especially for people with diabetes? After all, these people are the most intolerant of high-carbohydrate foods.

In addition, the practice of consuming large amounts of these refined foods never existed on the planet until a few hundred years ago. How could humans adapt to them in such a short time on the evolutionary time scale?

So, on February 8, 2012, I started my new lifestyle: a ketogenic diet added to resistance training, swimming, biking, and running that I started in 2007. From what I had learned reading The Paleo Diet, I had already eliminated milk, grains, sugar, starchy legumes, and all processed foods in November 2011.

Following The Paleo Diet led to a 45% reduction in mealtime insulin dose, but no improvement in my average blood sugar nor any reduction in hypoglycemic episodes. I needed carbohydrate restriction added to the mix. In order to reduce my carbohydrate intake to 25 – 35 grams/day, I eliminated potatoes and fruit except for a few strawberries or blueberries occasionally. To replace calories from the carbohydrates that I eliminated, I increased my dietary fat using butter, heavy whipping cream, tallow, lard, and coconut and olive oil. I simultaneously reduced my insulin doses (both long-acting and short-acting insulins) from about 54 units/day to about 25 units/day over the next week or so, but I still frequently adjusted the insulin dose based on my blood sugar readings and exercise. The variables I tracked included insulin doses, exercise type and duration, and fat intake based on appetite and energy expenditure. The constants I sought to maintain included the ketogenic diet, protein and carbohydrate intake, and my goal of an average blood glucose of 83 mg/dL.



Once adapted to the ketogenic diet, I was able to increase my training distances without needing to eat significant amounts of sugar. I developed the habit of carrying both insulin and glucose tablets with me just in case, but rarely needed either of them. I no longer feared hypoglycemia while exercising and my hyperglycemia improved markedly.

On October 20th, 2012, I completed the Great Floridian Triathlon, an ironman distance event in [15.5 hours](#) with no need for any glucose, sugar, or food, using only my body fat reserves for energy. I had no hypoglycemia, but did have mild hyperglycemia that I did not treat with insulin because I was expecting my blood sugar to fall at some point during the event. My blood sugar at the end of the event was 156 mg/dL.

My HbA1c improved gradually, from 6.5% on average before the ketogenic diet, to 5.6% in the first year on the ketogenic diet. In 2013, it remained at 5.6% and in 2014 came down to 5.1% on average.

The A1C Now+ meter, shown in the photographs on the right, seems to correlate closely with the laboratory HbA1c and can be done at home on a more frequent basis without a physician's order.

My blood tests have improved in the manner typically seen on a ketogenic diet. Triglycerides decreased from an average of 76 to 65 mg/dL, HDL cholesterol increased from an average of 61 to 90 mg/dL, the triglyceride/HDL ratio decreased from 1.31 to 0.72 and the calculated LDL cholesterol increased from an average of 103 to 162 mg/dL, but later came down to 132 mg/dL. The hs-CRP (high sensitivity C-reactive protein, a marker of inflammation) decreased from 3.2 to 0.7 mg/L.

Today, I have no complications from diabetes and with my improved glycemic control, my outlook on life has improved dramatically.



Keith Runyan, MD Nov. 23, 2013



Keith Runyan, MD 3/8/14